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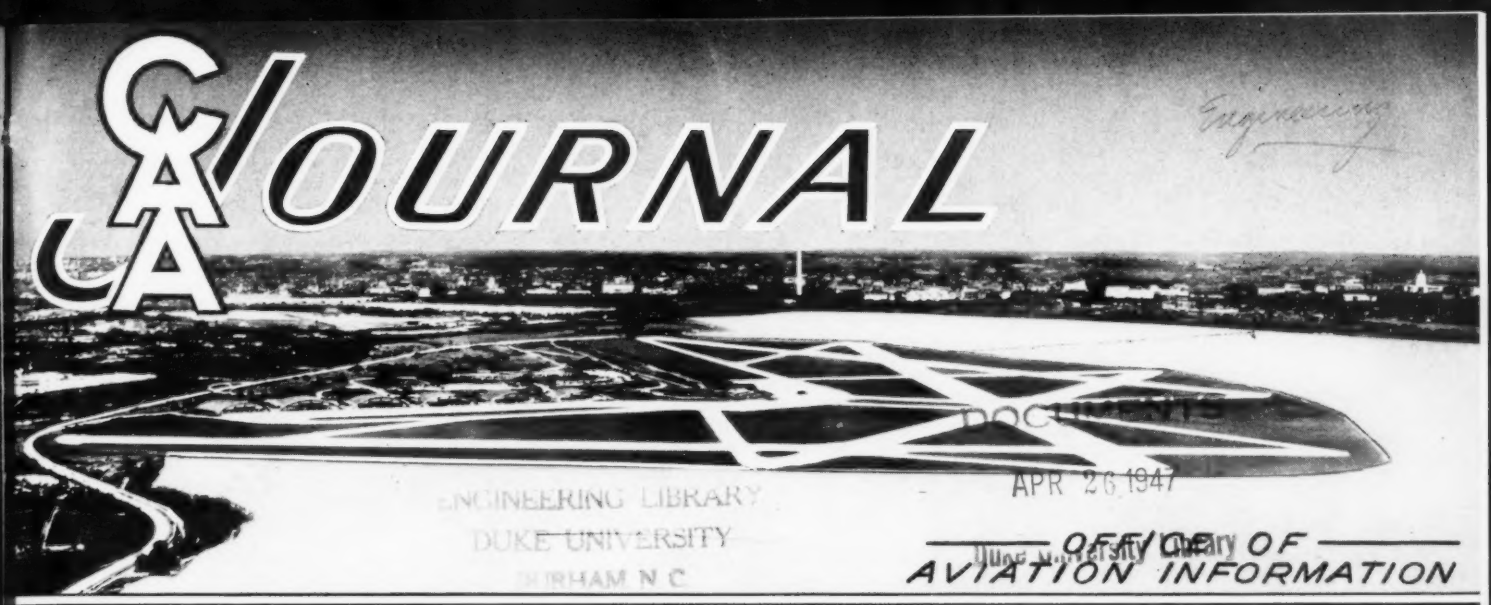

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OFFICIAL ORGAN OF AVIATION INFORMATION

Radar Put into Operation As Aid to Civil Aviation

Radar began its active work in civil aviation in April when the Civil Aeronautics Administration and the Army officially turned on the radar landing aids at the Washington National and Chicago Municipal Airports.

Officially Launched—The precision landing beam equipment, familiarly known as GCA (ground controlled approach) was put into daily operation at the Washington National Airport with accompanying ceremonies. In attendance were T. P. Wright, Administrator of Civil Aeronautics; Maj. Gen. Harold M. McClelland and Maj. Gen. Curtis E. LeMay of the Army Air Forces; and Admiral Emory S. Land, President of the Air Transport Association.

Similar equipment, lent to the CAA by the Army and installed by the Air Transport Association, has been added to the landing aids at LaGuardia Field in New York.

A MEW (microwave early warning) radar screen has also been installed in Washington and is being installed at LaGuardia. The equipment at Washington was lent to the CAA by the Army, and that at New York was transferred from the ATA's Airborne Instrument Research laboratory at Mineola, L. I., to LaGuardia Field. It will be used at each place for service testing to determine its value in airway traffic control.

Radar scopes for the GCA are located in the airport traffic control towers, where they will be manned by CAA men who have been especially trained by the Army. Scopes of the MEW are installed in the airway traffic control centers, and will be manned by CAA and Army traffic controllers.

Adapted to Civilian Needs—"This represents the kind of cooperation we need to make progress in aviation," Mr. Wright said, in discussing the application of radar to commercial aviation problems. "In the midst of conflicting stories of the value of this or that flying aid, the Army and the CAA have gone along in harmony as to general policy, and we come now to the stage of practical application of military-born devices to civilian needs. All of us recognize that such developments move slowly, and we know that it is impossible to skip any one of the four time-consuming stages in such development. They are invention, development, service testing and production. In the case of these radar developments, we have the additional fact to consider that they were first produced and used in military aviation during a war. The Army and the CAA realize, even if the feature writers and the public do not, that military flying, particularly in war time, differs importantly from commercial flying, and the transition takes time.

"We have accepted the Army's offer of 20 additional GCA sets which we will install, if funds are made available, at the busiest air terminals. This volume of experience under actual service conditions will rapidly give us all the information we need to appraise it and fit it into our commercial operations."

"The Army is gratified to see one of its flying aids take its place in daily service to the flying public," General McClelland said. "Our experience with ground controlled approach equipment has been satisfactory, and from my point of view, it is adequate for the job of landing under instrument conditions. The Army stands ready to assist in development and improvement of all such aids to flying, and will cooperate with the CAA and the airlines in such work."

Civilian GCA—GCA equipment, as modified for control use by the CAA, is installed in a truck and trailer on the field with the scopes "remoted" to the

(See Radar Aids, page 44)

Personal Plane Conference Set for April 15

The Aircraft Industries Association of America will meet with representatives of the CAA, NACA, Army and Navy in Washington on April 15 to discuss the development of better personal aircraft.

The meeting, which is the result of a proposal made by William A. M. Burden, Assistant Secretary of Commerce, in his January 30 address to the Institute of Aeronautical Sciences, will explore the possible need for government assistance in improving personal aircraft.

The group will consider what the participating agencies are doing in the field of personal aircraft research, and, if government aid is needed, what form it should take.

Lower Minimums Set for Airplanes Landing on ILS

Scheduled airlines using the instrument landing system now may operate under lower ceilings and visibility, T. P. Wright, Administrator of Civil Aeronautics, has announced.

The CAA instrument landing system, using a series of high-frequency radio beams, provides the pilot with an electronic path which leads him down through fog and rain to the airfield runway.

Use of the system will result in fewer airline schedule cancellations because of bad weather, and in increased safety during landing approaches. Also, it is expected to speed up the movement of traffic at congested airports, and result in less time being spent by air travelers in "stacks" above an airport while waiting to land.

Demonstration Required—Before use of the lower minimums is approved, each airline must demonstrate that it has proper equipment, a suitable training program to familiarize pilots with the instrument landing system, and that the pilots are capable of making instrument landing system approaches.

Airlines meeting these requirements, Mr. Wright announced, can make straight-in approaches when the ceiling is 100 feet below present minimums and visibility one-quarter mile less than present regulations require. At many airfields the present minimums are ceiling 400 feet, visibility one mile.

May Be Reduced Further—After an airline has had six months of satisfactory experience with the instrument landing system, its ceiling minimum may be dropped another 100 feet and permissible visibility reduced another one-quarter mile. Experience may demonstrate that still further reductions can safely be made, but the CAA has no immediate plans for reducing ceilings below 200 feet or visibility below one-half mile at any field.

The Administrator emphasized that the new instrument landing system minimums are for straight-in approaches only, and have no effect on landing minimums now in effect for ordinary instrument approaches where circling is necessary to land on the proper runway.

ILS in Operation—The CAA instrument landing systems in complete operation on April 4 follow:

Atlanta, Ga.; Albuquerque, N. M.; Amarillo, Tex.; Billings, Mont.; Brownsville, Tex.; Columbus, Ohio; Charleston, S. C.; Covington, Ky.; Dallas, Tex.

(See ILS in Operation, page 44)

CAB Clarifies Stand on Entry Of Sea Carriers in Air Transport

In a clarification of its position with respect to the entry of surface carriers into air transportation, the Civil Aeronautics Board has issued a statement modifying its previous stand.

The statement was made in response to the request of nine steamship companies that the CAB make clear their position as applicants for air carrier certificates.

Not a Legal Barrier—The Board majority held that compliance with the legal restrictions contained in section 408(b) of the Civil Aeronautics Act (the section relating to consolidations, mergers and acquisitions of control) cannot be considered a legal condition in granting a certificate of public convenience and necessity to a surface carrier.

It stated, however, that the policy of Congress as revealed by that section, and particularly by its second proviso, must be considered by the Board as one of the standards which guide it in determining whether public convenience and necessity require that a certificate be issued to a surface carrier.

The majority opinion was signed by Vice-Chairman Ryan and Members Lee and Young.

Landis Stand—Chairman Landis, in a separate opinion concurring in the result, disagreed with the legal proposition stated by the majority that the Board may consider section 408(b), including the proviso, as one of the standards bearing upon the question of public convenience and necessity.

He took issue with the position of the majority which declared that it was the intention of Congress "to carefully regulate the participation of surface carriers in air transportation" since "such carriers would often be the possessors of powerful competitive weapons which would enable them to crush the competition of independent air carriers."

Chairman Landis did not express a view on the general policy of permitting surface carriers to engage in air transportation, believing that such policy should be evolved in future cases as they are presented to the Board.

Branch Interpretation—Member Branch, in a dissenting and concurring opinion, interpreted the Civil Aeronautics Act as containing a legal prohibition against the entry of a surface carrier into air transportation, unless the surface carrier shows that it can use aircraft to public advantage in its operation.

In this respect he differed with the view of the majority that the Board has the power to permit a surface carrier which does not meet this test to engage in air transportation, if it is shown upon the facts of a particular case that the disadvantages which exist by reason of its being a surface carrier are avoided or overcome by other considerations of public interest supported by the record.

Power to Limit Operations—"In view of the principles and policies set forth in section 2 of the Act," the majority opinion states, "we are convinced that the Board has the power and duty . . . to limit the entry of a surface carrier into air transportation to operations which would enable such surface carrier to use aircraft to public advantage in its surface transport operations unless the record of the case were to reveal that the public interest required service by a surface carrier regardless of the circumstance that it was a surface carrier."

In the majority view, "the Board would not be justified in closing its eyes to the potential threat which the entry of surface carriers into this field would in many cases offer to independent air carriers or to the effect which such participation might have upon the fulfillment of the policies of the Act. Surface carriers engaging in air transportation would at times be under a strong incentive to act for the protection of their investment in surface transportation interests."

Cites Rail and Motor Cases—Pointing out that this threat is not peculiar to air transportation, the majority opinion cited decisions of the Interstate Commerce Commission which have sought to safeguard the development of motor transportation against the unrestricted entry of rail carriers into the motor carrier field.

The Board stated, "it is difficult to understand the contention of the petitioners that surface carriers stand in no different situation than any other applicants in relation to the issue of public convenience and necessity."

Applicants engaged in businesses shown to be in conflict with the interests of air transportation would find it more difficult to comply with the standards of the Act than other applicants, the majority opinion said. "This would not only be true of a surface carrier applicant: it would also be true of an applicant engaged in the manufacture of civil aircraft suitable for air carrier operations, or an investment banking company engaged in the marketing of airline securities or indeed any other applicant that was engaged in any business shown upon the evidence to be in conflict with the interests of air transportation."

Denies Investigation—While divided on the legal question of the interpretation of the provisions of the Civil Aeronautics Act which regulate the entry of surface carriers into air transportation, the Board was unanimous in adopting an order denying the petition of the nine steamship companies for an investigation "of the whole question of the participation by American steamship companies in foreign and overseas air transportation" and for a public hearing on this subject.

Seven Members Appointed To Nonscheduled Committee

Seven new members have accepted appointment on the Nonscheduled Flying Advisory Committee, T. P. Wright, Administrator of Civil Aeronautics, has announced.

New members include Oliver Parks, head of Parks Air College, East St. Louis, Ill.; Leslie (Doc) Marsden, veteran air service operator of Buffalo, N. Y.; William L. Anderson, Executive Director of the Pennsylvania Aeronautics Commission; Dick Depew, Connecticut, one of America's earliest private flyers; John W. Friedlander, President of Aeronca Aviation Corporation, Middletown, Ohio, and Chairman of the Personal Aircraft Council of the Aircraft Industries of America; George Haddaway, vigorous editor of Southern Flight, Dallas, Texas; and Don Flower of Cessna Aircraft Corporation, Wichita, Kans.

Mr. Wright asked Fred Weick, of Engineering Research Corporation, Riverdale, Md.; Harry Playford, St. Petersburg, Fla., banker and nonscheduled operator; Edward Williamson, Seattle, Wash., private flying enthusiast; William A. Mara, Detroit, Mich., private flyer; and B. Allison Gillies, San Diego, Calif., consulting aeronautical engineer, to continue on the committee.

"The advice received from this committee since its beginning in 1945 has been of great value to the CAA," Mr. Wright said, in discussing the new makeup of the committee. "Periodically we change the personnel of the group in order to get new opinions, and to get wide geographic coverage of the problems facing nonscheduled flying. I consider the present committee a very strong one, and believe that they will be very helpful in the coming year, when nonscheduled commercial flying enters the second stage of its growth, and private flying faces serious, postwar problems."

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Department of Commerce
W. Averell Harriman, *Secretary*

Civil Aeronautics Administration
T. P. Wright, *Administrator*

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PREPARED BY CAA AVIATION INFORMATION

ICAO Replaces Provisional Body As World-wide Air Organization

A permanent world-wide aviation organization came into being April 4, when the International Civil Aviation Organization succeeded the Provisional International Civil Aviation Organization.

The Department of State has announced that 35 countries have ratified the Convention on International Civil Aviation, drawn up and signed at the Chicago Conference Dec. 7, 1944. The Convention charted the basic principles for air transport between countries and provided for an international governing body. A provisional body was set up until the requisite number of nations, 26, had ratified the Convention.

The nations which have ratified the Convention so far are: Argentina, Australia, Brazil, Canada, Chile, China, Czechoslovakia, Denmark, Dominican Republic, Egypt, Ethiopia, Greece, India, Ireland, Liberia, Mexico, New Zealand, Nicaragua, Paraguay, Peru, Philippines, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, Union of South Africa, United Kingdom, United States, Trans-Jordan, France, Iceland, Netherlands and Venezuela.

PICAO, which has been in operation since August, 1945, has brought about concerted action by the nations of the world in organizing and in maintaining the facilities and services necessary for international air transport, and in establishing world-wide standards and procedures for the safety, regularity and efficiency of international air traffic.

In announcing receipt of the necessary ratifications the State Department said: "The remarkable energy and spirit of cooperation with which the provisional organization has attacked and solved many problems serves as an outstanding example in the field of international accord. This success has been in no small part due to the wisdom and vision of the president of the interim council, Dr. Edward Warner, and to the high caliber of the representatives of the 21 governments which compose the interim council."

The initial meeting of the permanent air organization will be held May 6 when the first assembly meets in Montreal, Canada.

To give continuity to the activities of the organization, PICAO will carry on its work until ICAO begins operation.

Proposed Regulation

The CAB Safety Bureau has asked for comment on a proposed regulation which would require all holders of instrument ratings to pass an instrument check within six months preceding any instrument flight. If adopted, the requirement would be an amendment to 43.683 of the Civil Air Regulations.

Anti-noise Program Making Headway, Wright Announces

The noise nuisance from low-flying aircraft has been reduced substantially in many parts of the country, T. P. Wright, Administrator of Civil Aeronautics, has announced in reviewing progress of the CAA anti-noise program.

Present-day aircraft, particularly of the large transport type, inevitably make considerable noise. The noise brought a flood of public complaints last year, and Mr. Wright urged research to develop quieter types of engines and propellers.

In the meantime, however, the CAA has found that much of the annoyance to persons on the ground can be avoided by changing the traffic patterns around airports, and by pilot cooperation in using suitable power and propeller-pitch settings.

Civil Air Regulations forbid flying below 1000 feet over congested areas "except when necessary for taking off and landing." When acceptable evidence is available, pilots who violate the regulation are prosecuted.

Changes in Traffic Pattern—Much of the noise, however, originates during landings and take-offs from fields close to residential areas. In such cases, the traffic pattern around the airfield often can be changed to take the planes over water, industrial districts, or wastelands. Changes are made usually after discussion of the problem by the airport operator and the local CAA inspector. In many cities, such changes have virtually eliminated complaints.

At Los Angeles Municipal Airport, for example, take-offs and landings are made over unpopulated areas wherever possible, instead of over residential districts. In addition, airline pilots now maintain a minimum of 1000 feet while approaching the field, descending only after they are reasonably close to the landing area.

Airmen Cooperating—Similar arrangements have been made at hundreds of fields in the United States, and there has been a substantial drop in the number of complaints against noisy airplanes. Most pilots and airport operators, realizing the seriousness of the situation, have cooperated wholeheartedly.

Until research produces practical methods of building quieter airplanes there can be no complete solution to the problem. The CAA efforts to date, however, have demonstrated that even with present-day aircraft, much can be done to make airfields better neighbors than they have been in the past.

Stall Warning Device Shown In Washington Demonstration

A stall warning device originally developed in cooperation with the Civil Aeronautics Administration was demonstrated last month at the Washington National Airport.

The device, now in production, flashes a red light and sounds a horn in the cockpit when a plane is in danger of stalling. It is composed of a wing vane connected by an electric circuit to a warning unit on the instrument panel. According to the manufacturer, the device weighs less than a pound, can be installed by an A and E mechanic, and sells for $35.

The wing unit comprises a small tab of metal, or vane, which protrudes outward from the leading edge of the wing. Operating on the aerodynamic principle that a wing cuts the air so that some of the air passes above and some below the wing, the vane is placed so that in normal flight the air flow keeps the electric circuit open. As the wing approaches the stall, the vane flips up, thereby closing the electric circuit and actuating the light and horn in the cabin.

Civil Aviation Highlights

Civil aircraft production, January	2,054
Two-place models	857
Three- and four-place models	1,176
Over four-place models	21
Washington National Airport operations, February:	
Passengers departing	35,010
Passengers arriving	33,101
Aircraft arrivals and departures	11,584
Scheduled Air Carrier Aircraft, March 1	839
Domestic service	690
International service	149
Total registered aircraft, March 1	88,755
Airports in operation, March 1	4,703
Commercial	2,103
Municipal	1,477
CAA intermediate	201
Military	761
All others	161

NOTE—This box presents significant information on various important phases of civil aviation each month.

Fifty Youths from Philippines To Get CAA Aviation Training

Fifty young men from the Republic of the Philippines will register early in May at the Civil Aeronautics Aeronautical Center, Oklahoma City, Okla., for air traffic control instruction at the Will Rogers Field, and academic schooling at the Oklahoma City University.

While in this country the students will receive technical instruction in handling air traffic.

This will be the first group of CAA students from the Philippine Republic, under the Philippine Rehabilitation Act. All of the 20 republics of Central and South America have been represented in CAA classes since 1941, with a total enrollment of 869. Of this number, 597 are putting their United States training to use in their respective countries, as pilots, mechanics, or technicians.

The technical courses qualify the graduates as airport traffic control tower operators, aircraft communicators, or aircraft dispatchers. The academic work will lay special stress on mastery of conversational and technical English and orientation to American customs.

Transportation from the Philippines and return at the completion of training is provided, and a grant for sustenance made. Accident insurance and medical attention also are supplied.

Chicago to Gander Route Chart Issued by Coast and Geodetic

A new route chart, designed to meet the requirements of air carriers operating over the North Atlantic and using high speed, high altitude, long-range aircraft, has been published by the Coast and Geodetic Survey, Department of Commerce.

The chart, titled "Chicago, Illinois, to Gander, Newfoundland (No. 2201)", covers all international air routes originating in the United States and extending to trans-oceanic take-off points in Newfoundland and Labrador so that only one chart is necessary for all such operations on this side of the Atlantic.

It employs an oblique Mercator projection based on the route between Chicago and Gander. The chart is constructed on the scale of 1:2,000,000 which is smaller than the scales used previously in the standard flight charts, but considered highly satisfactory for high altitude flights.

The chart, 26 by 54 inches flat, is accordion folded to 7¼ by 13 inches, and is for sale at 25 cents by the Coast and Geodetic Survey.

CAA Age Study Shows Most Pilots Are Young Persons

When Americans are young and have little money, they fly private planes. When they get older, and begin to earn more, they don't do so much flying.

Two interesting curves in graphic form tell this story in a study made by the Civil Aeronautics Administration, entitled "Age Study of the Flying Public," and available from the CAA Office of Aviation Information.

Half of Pilots 20 to 29—The study shows that almost 50 per cent of all pilots are found in the two age groups of 20-24 and 25-29, while persons in these groups comprise only 19 per cent of the total population 16 years or older. Less than 5 per cent of persons in these age groups earn $5000 a year. Two-thirds of the people who earn $5000 a year or more are between the ages of 35 and 55, but the proportion of all pilots in those age groups drops sharply from 10 per cent at 35 to almost nothing at 55.

Many other revealing facts on the general private flying situation are contained in the study, made under the direction of Dean R. Brimhall, Assistant to the Administrator for Research, in cooperation with the Office of Aviation Information.

Based on Sampling—The basic information was gathered from the medical records of 10,000 pilots who came up for medical examinations and were certificated during 1945 and 1946. Student pilots, and those holding private, commercial and airline certificates were included. The study did not include pilots in the military services, nor those who obtained their certificates on the basis of military flying experience. The 10,000 sample is considered adequate on which to base general conclusions about the total number of pilots now certificated.

Only in the age groups between 16 (the age at which flying is first permissible) and 35 is the proportion of pilots higher than the proportion of the age groups in the total population. Beyond 35, the percentage of pilots drops rapidly. Apparently, Americans quit flying completely at 65, although there are known to be several sexagenarian pilots still active in the United States.

There are 8,574,000 persons in the United States between 16 and 19 years old. Of the 258,000 pilots certificated in 1945, 14.4 percent were in that age group, a total estimated number of 37,152. On the basis of the total population of that age, there were 4.3 pilots per thousand population. In the 20-24 age group, there are 7.2 pilots per thousand population and in the 25-29 group, 6.8.

Earning Age Group—In the 40-50 age group, there are but 2.3 pilots per thousand, and it is in this age bracket that most people earn $5000 or more a year.

Other interesting revelations of the study are:

One half of the 6,730 student and private pilots included in the CAA sample are in the 20-24 and 25-29 age groups.

For all age groups above 44, there were only four airline pilots out of the 302 sampled, only 93 commercial pilots out of 2,968, and only 311 student and private pilots out of 6,730.

In the 16-19 age group the ratio of pilots to those earning $5,000 a year is 232 to one. In the 65-69 age group, that ratio changes to one to 194.

Male and female pilots are relatively in the same proportion in the various age groups, with a few more females flying in the 20-24 age group.

The complete report contains information never before published on the "customer pool" for airplanes, and is of especial value to manufacturers and distributors of the personal plane.

Civil Aircraft Assigned Frequencies For Military GCA In Emergencies

New radio frequencies now make it possible for civilian airplanes to use Army and Navy radar facilities in an emergency.

The Army and Navy offered use of ground controlled approach equipment to civilian airplanes in distress several months ago, but the military GCA equipment used radio channels which were not available to civilian pilots.

Available to All Civil Planes—Now, however, the military services, in cooperation with CAA, have worked out an arrangement of frequencies which will make the service available to scheduled and nonscheduled commercial planes, and also to private pilots who have an ordinary range-receiving radio.

The very high frequency of 140.58 megacycles is available for direct two-way communication between the airplane and the radar operators on the ground. Scheduled aircraft will equip their planes to receive this frequency as soon as possible.

Meanwhile, the GCA installations have been equipped for two-way communication on 3117.5 kilocycles, a standard frequency now in use by scheduled carriers. For nonscheduled and private pilots, directions from the GCA operators will be relayed by the local military control tower using a frequency between 200 and 400 kilocycles. All radio-equipped planes can receive this frequency, and the pilots can talk directly to the GCA operators on the standard frequencies of 3105 or 6210 kilocycles.

Army and Navy GCA installations will be listed in the Airman's Guide, published every two weeks by the CAA, and each CAA traffic control center, control tower and communications station will maintain an up-to-date list of operating hours and frequencies for GCA facilities in the region.

Emergency Action—When an emergency is declared in which GCA might be helpful, the CAA will advise the pilot or company representative of available GCA installations, together with information on weather conditions at each available facility. After the pilot chooses a military field for GCA letdown, CAA traffic controllers will give him an appropriate track to the field and whatever traffic clearance is necessary.

The CAA traffic control center, meanwhile, will alert the AAF or Navy tower where the GCA unit is in operation, and maintain continuous contact with the tower until the plane in distress has landed or is under control of the GCA operators.

About 25 military GCA facilities are operating in the continental United States, most of them in California and along the East Coast. CAA-controlled GCA units will be operating at Washington, New York, and Chicago in a few weeks. Funds for 20 additional installations of GCA have been asked from Congress.

Where They Are—Military facilities are now in operation at the following locations:

AAF GCA Installations—Andrews Field, Camp Springs, Md.; Barksdale Field, Shreveport, La.; Clinton County AAF, Wilmington, Ohio; Fairfield-Suisun AAF, Fairfield, Calif.; Langley AAF, Va.; Mitchel Field, Hempstead, N. Y.; Westover AAF, Chicopee Falls, Mass.

Navy GCA Installations—Charlestown NAAS, R. I.; Corpus Christi NAS, Tex.; Floyd Bennett NAS, N. Y.; Jacksonville NAS, Fla.; Miramar NAS, Calif.; Moffett Field NAS, Calif.; Norfolk NAS, Va.; Oakland NAS, Calif.; Olathe NAS, Kans.; Patuxent River NAS, Md.; Saufley NAAS, Pensacola, Fla.; Seattle NAS, Wash. (Sand Point); Whidbey Island NAS, Wash.

Installations at the following will be put in operation later:

Eglin AAF, Valpariso, Fla.; Atlantic City NAS, N. J.; Cherry Point MCAS, N. C.; El Toro MCAS, Calif.; Squantum NAS, Mass.

The Navy GCA installations in operation at Argentia, Newfoundland, and Kodiak, Alaska, will also be available in an emergency.

CAB Approves 10% Raise In Airline Passenger Fares

A 10 percent increase in passenger rates for 16 domestic airlines has been approved by the Civil Aeronautics Board.

The Board's approval extends for 90 days from April 1 when the new rates went into effect. At the expiration of 90 days the carriers will be free of obligations contracted in the agreement.

Higher operating costs warrant the increase in fares, the Board said.

The Air Transport Association has estimated that the revenue from the higher fares will amount to over $25 million for the industry.

Emory S. Land, President of the Air Transportation Association, states that U. S. Airlines suffered losses in 1946 amounting to approximately $10,000,000. Out of the 16 airlines carrying passengers, 11 lost money in varying amounts, and in the case of some carriers the losses were such as to cast doubt on their ability to continue in business unless revenues were increased.

If the proposed passenger increase had been in effect during the past year, the industry would have netted a relatively small profit instead of suffering a serious loss, Admiral Land told the Board.

Operating expenses for the industry in 1946 increased 61 percent over those in 1945, as compared with the 33 percent increase in revenues.

Two-place Planes Lose Lead In Small-craft Production

For the first month on record, January shipments of three- and four-place planes exceeded those of two-place planes. The 1,176 three- and four-place planes shipped were 37 percent more than in December, while the 857 two-place planes represented a 17 percent drop. Shipments of two-seaters have been declining for several months; three- and four-place shipments have been steadily gaining.

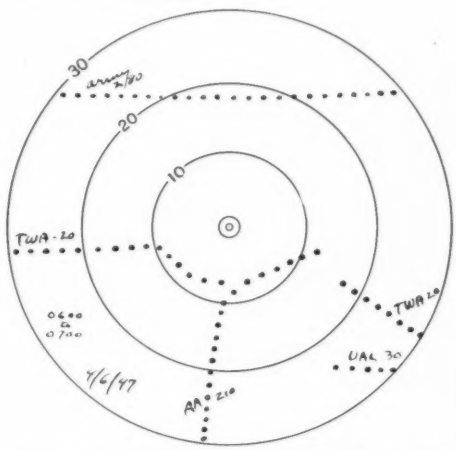
A combined total of 2,054 civil planes, valued at $8.3 million, was delivered, an increase of 8 percent in numbers and 30 percent in dollar value over December. The backlog for non-military customers on January 31 amounted to 22,017 planes valued at $436 million.

January 1947 civil plane shipments were:

	January	*December*
Total	2,054	1,909
By number of places:		
2-place	857	1,034
3- and 4-place	1,176	861
Over 4-place	21	14
By number of engines:		
1-engine	2,034	1,896
Multi-engine	20	13
By total rated hp (all engines):		
1-74 hp	298	398
75-99 hp	554	626
100-399 hp	1,179	871
Over 399 hp	23	14

CAA Developing Recording Device For Radar Signal

Developments looking toward better use of radar scanning screens in airport traffic control towers, including a permanent paper record of the paths of the planes controlled, are under way at the Experimental Station of the CAA at Indianapolis.



This specimen graphic record shows how radar scanning screen signals will appear when recorded by a method now under CAA development. The dotted lines show the paths of the planes across the screen. The traffic controller, once he has identified a plane, jots down facts which enable him to follow the plane's course easily.

One of the difficulties connected with the use of the radar screen in traffic control revolves around the nature and impermanence of the signals seen by the operator. As in all radar, these are small "pips" of light on a green screen and, in order for them to be visible in daylight, this screen must be hooded. The operator views it through a small peephole, because the tower, mostly built of glass, has a high level of brightness throughout the day.

A plan devised by Henry I. Metz, until recently radar specialist at the station, would produce a graphic record of the signals appearing on a radar screen through use of the equipment used now in facsimile broadcasting. This record could be viewed with perfect legibility in daylight as well as dark, and would serve as a record of the traffic at the field during the time marked on the individual sheets, which could then be filed as a record.

Most important is the necessity for the controller to establish the identity of the airplane being "seen" by radar. As of today, the plane appears only as a dot of light on the screen when the sweep hand passes its position on the screen. Its previous positions must be remembered by the controller if he is to plot its course. While this can be done for a few airplanes, there may well be scores of planes shown on a screen at one time at busy terminals. As he establishes the identity of any airplane, the controller jots it down on the sheet alongside the signals it produces.

These signals appear as dots each time the antenna sweep goes around—approximately 30 revolutions per minute—and the record appears as a dotted line on the paper. The paper record does not preclude the use of the conventional radar scope for checking purposes, but it does reduce the concentration required of the operator, and reduces the need for a full time radar observer.

Examiner Favors Helicopter Try-out For Los Angeles

A report favorable to helicopter air mail service in the Los Angeles area has been made by CAB Examiner Ferdinand D. Moran, with Los Angeles Airways, Inc., recommended to provide the service on a three-year trial basis.

Examiner Moran based his choice of carriers on the grounds that Southwest Airways Company, the other applicant for the service, is conducting an experimental feeder service in California which, he believes, should receive Southwest's undivided attention. Feeder service, he points out, presents a set of complex problems entirely different from those of helicopter postal service.

Three-Week Demonstration—The report follows a Board hearing on the Los Angeles Helicopter Case held last September, and a three-week air mail carrying demonstration conducted by the Post Office Department during July 1946, which proved the helicopter to be a time saving machine between airport and local post offices.

In many instances, slowness of present surface transportation to and from the airport offsets the time saved by transport planes on flights from distant cities, Examiner Moran stated. Helicopter service will make it possible to deliver Los Angeles mail coming from east of the Mississippi River the same day it arrives, and will make next-day delivery of mail to the Eastern Seaboard a routine matter.

He recommends that the certificate be granted on an area basis along general routes rather than the usual point-to-point basis to permit necessary changes after the experiment gets under way. Operations, he believes, should be limited to a 50-mile radius from the Los Angeles Municipal Airport.

Proposed Route Pattern—The initial route pattern, he suggests, should be the one recommended by the Post Office Department, since it has the primary information on postal service needs and will bear the cost of the operation.

The Post Office recommends that pickup and deliveries be made over three circular routes radiating out of the Los Angeles Municipal Airport to 30 post offices in the area. Surface carriers would collect the mail from post offices on the helicopter route and deliver it to 44 additional post offices.

The three round trips would be scheduled in the early morning, noon and very late evening, six days a week. The first two flights are designed to connect with letter-carrier deliveries, and the third flight to collect business mail at the close of the business day.

Estimated Mail Load—The Post Office has estimated that about 21 percent, or a daily average of 14,529 pieces of incoming mail could be expedited by helicopter.

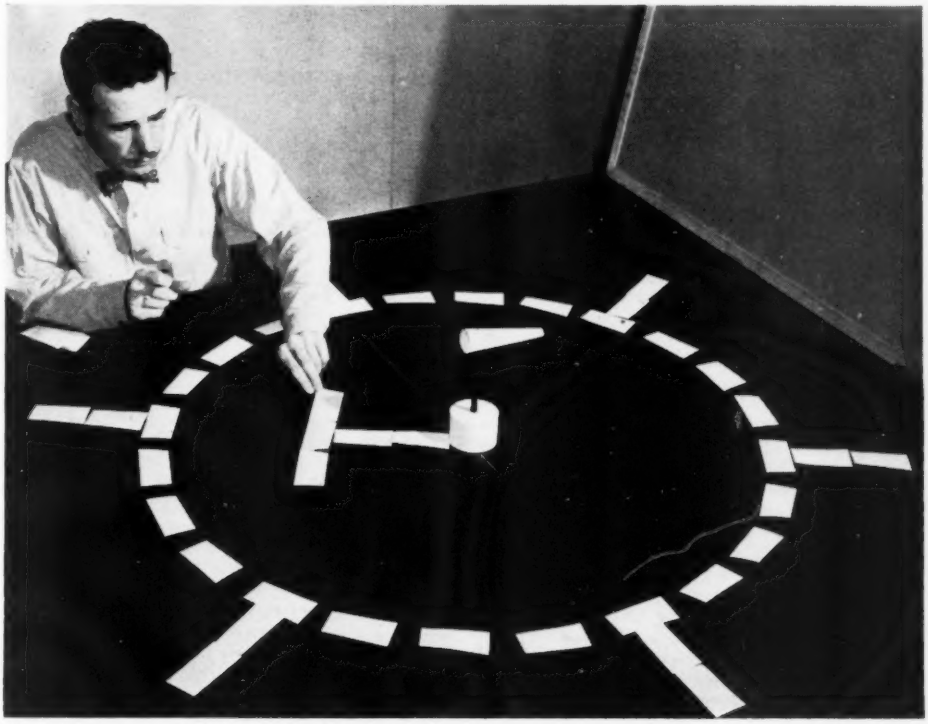
The tremendous size of Los Angeles, its great distances, heavy traffic, and lack of an adequate public rapid transit system such as subway or elevated railway favor the experiment, Examiner Moran stated.

Although the over-all performance of the helicopter is still considerably less than the airplane, and its cost a ton-mile is much higher, it has reached the development stage where it holds promise in performing special jobs the conventional airplane cannot do, he concluded. Using full power the helicopter can land and take off from a site little larger than the diameter of its rotor. Without power it needs a considerably larger landing place. The minimum size of usable landing site is about 300 feet square.

No Collection Stops—According to Post Office plans the helicopter will be equipped with a pickup device to collect as well as deliver mail without stopping. The machine will slow down over a post office, automatically pick up the outgoing mail, and bring it up into the aircraft with a tilting device. At the same time it will drop the mail destined for that office into a net. The pouch will drop down a chute into the post office work room for processing.

Post Office inspectors have found that with the relocation of electric power lines, helicopters will be able to make pickups and deliveries on all the government buildings on the proposed routes.

New, Inexpensive Airport Marker System Devised for Small Fields by CAA Engineer



How the segmented-circle small airport marking system was born. Clyde Carlstrand, CAA Airport Engineer, experimenting with cards representing large panels to be laid on airports as markers. Carlstrand and other CAA airport workers wore out several sets of cards arriving at all the possibilities of such a marking system.

A Civil Aeronautics Administration engineer has worked out a new and inexpensive method of marking small airports for the benefit of approaching pilots.

Information about the "segmented-circle" system has been released by the CAA for comment by airport operators and pilots, and the Administrator stated that he will consider regulations accepting this type of marker if the reactions are favorable. Preliminary field tests in Washington have shown that the markers are easily visible before entering the airport traffic pattern.

Developed by Clyde Carlstrand, Senior Airport Engineer, under the supervision of Phillips Moore, Director of Airport Engineering Service, the system uses panels of metal or any weather proof composition. Mr. Carlstrand estimates that a segmented circle 100 feet in diameter and four feet wide could be constructed under his system for a few hundred dollars against the present $2,000 for a concrete construction.

The plan is to put such markers in unused portions of airfields, where they will not be damaged by planes or other vehicles. The windsock, ordinarily hard to find from the air, would be spotted easily in the center of the circle, together with an L-shaped figure showing the direction of the traffic pattern of the field. Panels can be used to tell whether planes must use only the runways or whether the whole field is safe for landing; when the field is closed to all traffic; and when it is available only in emergency.

Mr. Carlstrand points out that still other signals can be added to tell the pilot just what services are available at the field, such as gas, food, and overnight lodging. Runway length and orientation information can be shown to aid pilots of larger planes which might want to use small fields.

The panels may be laid on the ground and held in place with weights, such as concrete blocks. If the ground is not level, they can be arranged on fence posts. In northern climates they can be placed in inverted V's for shedding snow, or have one side painted in a color that contrasts with the snow.

A limited number of booklets describing the plan in detail are available from the CAA Office of Aviation Information, Washington, D. C.

Castered-Gear

(Continued from page 48)

Mr. Geisse believes that if service testing confirms results so far, such landing gear might have profound effect on the planning of small airports in the future. Reduction in acreage requirements might, in some cases, he estimates, be as high as 80 percent and the cost of runways reduced to one-third that now required.

Administrator Wright has instructed CAA airport officials to prepare a study on the effect which this type of landing gear would have on the size of airports and landing strips.

Board to Probe Route Patterns Of 3 Airlines in Re-examinations

Within the past month the Civil Aeronautics Board has ordered investigations of the route patterns of three airlines which may lead to amendment or suspension of services over existing routes or routes not in operation.

The Board will re-examine part of Chicago and Southern Airlines' route in the Caribbean, awarded in the Latin American Case, and the route systems of Northeast Airlines and Colonial Airlines.

All three proceedings follow petitions for much higher rates of mail pay than those suggested by the Board.

Three Routes in Question—The Chicago and Southern hearing will be conducted on service from Houston to Havana, Cuba and Havana to San Juan, Puerto Rico, and Caracas, Venezuela, to determine if the carrier's certificate should be temporarily suspended over these segments.

The New Orleans-Havana segment, in operation since Nov. 1, 1946, is excepted from the present proceedings, the majority ruling that the carrier should be given a reasonable time to develop this route before the traffic and cost situation is re-examined.

Changes in the economic and traffic picture since the 1944 hearings in the Latin American Case, availability of services of other U. S. air carriers, and the cost to the government of Chicago and Southern's service over its Caribbean route figure in the Board's decision to review the need for operations beyond Havana.

The carrier also has advised the Board of its willingness to move as slowly and cautiously as the Board may feel proper in extending operations beyond Havana, and that it would incur no further costs on these routes without Board concurrence.

Mail Pay Revised Upward—Estimated operating costs and mail pay need have been revised upward since the 1944 hearings when the carrier estimated a break-even need of 19 cents a revenue plane mile for DC-4 equipment on the New Orleans-Havana route.

Last October, however, Chicago and Southern requested a temporary rate of mail pay of $1.73 for the New Orleans-Havana service, and shortly after beginning service asked that the rate be increased to $2.17.

In a January 28 show cause order the Board proposed a temporary 50-cent mail pay rate for the entire route, fixed by reference to the highest rates previously established by the Board for substantially similar service in the Caribbean area.

Outcome of the series of negotiations which followed was the acceptance by Chicago and Southern of a 95-cent rate for New Orleans-Havana service proposed by the Board in a show cause order, issued simultaneously with the investigation order for the remainder of the route.

Northeast and Colonial—Investigations of both Northeast and Colonial have been ordered to determine (1) to what extent, if any, the carrier's increasing dependence upon the United States government is due to uneconomic characteristics of its route pattern; (2) in what ways the dependence of the carrier's certificated operations upon the financial assistance of the government through mail payments may be decreased; (3) whether operations not yet inaugurated should be postponed indefinitely or for a period of time, and (4) whether a further proceeding should be instituted.

Northeast has asked a mail pay rate of 31.71 cents a plane mile for the year commencing May 1, 1945, and 25.23 cents after May 1, 1946, in contrast to the Board's proposals of 18.65 cents and 14.37 cents for the same periods. Northeast's proposals provide additional compensation of $1,152,000 to May 1, 1947.

Colonial has set its break-even need at 45 cents for the entire system and at 72 cents over route 71. Above these sums it asks a fair and reasonable profit and petitions that the rates be made retroactive from April 15, 1946.

Will Shape Policy—In a concurring statement in the Chicago and Southern Case which preceded the investigation orders for Northeast and Colonial, Member Harllee Branch indicated that investigation of this case will help shape policy in dealing with similar cases where unfavorable economic conditions develop between certification of a route and the start of operations.

He pointed out that the industry generally is faced with a substantial increase in costs and a marked decline in traffic volume. These factors point strongly, he said, to a substantial increase in the cost to the government for air mail transportation.

In regard to Chicago and Southern, he stated that the disparity between anticipated costs through mail pay and the amounts it now estimates it will need to operate the service is so great as to pose the problem whether the public need for the service at this time is sufficient to justify the financial burden it will impose upon the government.

Complete Investigation—Chairman James M. Landis, in a dissenting statement, held that the Board should not grant the 95-cent mail rate increase to Chicago and Southern without ordering an investigation of the New Orleans-Havana segment as well as the other three segments.

Pointing out that the picture has changed significantly since the route was awarded to Chicago and Southern, he said that there is a real question as to whether public convenience and necessity require the operation of this route by any carrier.

"I can not be a party to inaction that continues the obligation of subsidy created in behalf of Chicago and Southern, and that seeks to palliate by a temporary mail rate a situation where surgery may be the only remedy," he concluded.

Should Get Trial—Member Josh Lee dissented from the majority decision on the whole investigation issue. He expressed the belief that Chicago and Southern should be given a reasonable opportunity to test the worth of the entire route. Mr. Lee contended that an investigation at this time would be based upon another set of "estimates" since the Board has no operational data for three of the segments and only five months operating experience on the other segment on which to base a suspension decision.

Oswald Ryan, vice chairman, in a concurring statement said that an investigation of the New Orleans-Havana segment would be ill-advised since its effect might place a serious handicap on the efforts of the carrier in the months to come to prove the economic soundness of this service. "Although the carrier has been operating this segment for only five months, it has been steadily building up the traffic and deserves a reasonable opportunity to prove the value of the new service," he said.

Any action taken by the Board on the other segments should be in the form of a temporary postponement of operation until favorable economic conditions offer lower costs and higher loads, he indicated.

CAB Acts on Bermuda Stop

The CAB has taken steps to eliminate Bermuda as a full stop on Pan American's transatlantic route. The corrected certificate would permit Pan American to serve Bermuda as an intermediate point only when weather conditions required.

Passenger Traffic At National Airport Rises in February

More than 68,000 passengers, an average of 2400 daily, passed through the gates of the Washington National Airport in February. This total represents 8 percent or 5400 more passengers than in January and 14 percent or 8100 more than a year ago. Passengers boarding planes numbered 35,000 while incoming transports unloaded 33,000 passengers.

Airline transport aircraft ran up a total of 7600 arrivals and departures compared with 6900 a year ago, a gain of 10 percent. Total aircraft traffic for February at the Washington Airport (military, itinerant, local and air carrier) came to 11,600 arrivals and departures—an average of 414 take-offs or landings daily, or one every 3½ minutes.

The detailed record of air traffic at this airport during the past 14 months shows:

Airline Passenger Traffic

Month	Departing	Arriving	Total
1946			
January	31,803	32,393	64,196
February	31,879	28,102	59,981
March	40,911	37,489	78,400
April	54,410	48,835	103,245
May	58,984	52,102	111,086
June	62,960	57,614	120,574
July	62,766	57,786	120,552
August	69,180	62,677	131,857
September	62,519	58,565	121,084
October	56,524	55,137	111,661
November	55,434	50,665	106,099
December	54,595	47,150	101,745
Total	641,965	588,515	1,230,480
1947			
January	32,885	29,959	62,885
February	35,010	33,101	68,111

Aircraft Arrivals and Departures

Month	Air Carrier	Military	Itinerant	Local	Total
1946					
January	7,055	2,468	946	1,024	11,493
February	6,901	2,265	1,057	681	10,904
March	8,107	2,842	1,541	2,142	14,632
April	8,946	3,358	1,779	2,306	16,389
May	9,295	3,531	1,940	2,064	16,830
June	9,200	3,160	1,700	2,756	16,816
July	9,826	2,912	1,645	3,026	17,409
August	9,542	2,992	1,417	3,274	17,225
September	9,183	2,989	1,693	2,730	16,595
October	9,109	2,729	1,410	1,644	14,892
November	8,964	2,154	1,438	1,660	14,216
December	9,039	1,494	1,512	1,244	13,289
Total	105,167	32,894	18,078	24,551	180,690
1947					
January	7,123	1,365	1,307	1,412	11,207
February	7,613	1,403	1,368	1,200	11,584

Manual 50 Amended

An amendment to Civil Aeronautics Manual 50, effective March 15, 1947, has been announced by the Civil Aeronautics Administration. It relates to flight-equipment provisions under commercial flying school rating.

The following text, appearing on page 11 of the printed Manual, is deleted: "b. Training in aircraft of 145 horsepower or over."

Text substituted for the deletion follows: "b. Training in aircraft of not less than 145 horsepower, or in aircraft of not less than 125 horsepower providing the wing loading of such aircraft is not less than 11 pounds per square foot and the power loading is not more than 14 pounds per horsepower."

Domestic Scheduled Air Carrier Operations—January 1947

Source: CAB Form 41

Operator	Revenue miles flown	Revenue passengers carried[a]	Revenue passenger-miles flown (000)	Express and freight carried (tons)	Ton-miles flown		Passenger seat-miles flown (000)	Revenue passenger load-factor (percent)
					Express	Freight		
American Airlines, Inc.	4,616,155	159,589	91,002	1,749.0	396,728	545,035	144,323	63.05
Braniff Airways, Inc.	835,290	39,638	14,202	188.0	62,704	13,350	23,293	60.97
Chicago & Southern Air Lines, Inc.	481,520	15,315	6,097	130.0	41,551	10,179	11,805	51.65
Colonial Airlines, Inc.	197,502	7,646	2,209	13.5	3,240	0	3,857	57.27
Continental Air Lines, Inc.	384,336	11,965	4,091	36.0	7,601	8,740	7,914	51.69
Delta Air Lines, Inc.	830,381	30,588	15,424	329.0	58,387	27,200	24,823	62.14
Eastern Air Lines, Inc.	3,243,810	106,333	65,428	602.0	288,989	69,945	100,658	65.00
Inland Air Lines, Inc.	154,788	6,398	1,547	7.8	1,728	491	3,025	51.14
Mid-Continent Airlines, Inc.	378,575	16,356	4,872	34.7	9,923	1,282	7,624	63.90
National Airlines, Inc.	767,902	24,356	14,315	77.1	17,874	44,252	21,220	67.46
Northeast Airlines, Inc.	270,176	18,909	3,629	52.5	7,771	0	8,837	41.07
Northwest Airlines, Inc.	1,396,042	37,078	18,702	245.9	127,203	34,855	38,010	49.20
Pennsylvania-Central Airlines Corp.	1,168,126	63,104	15,521	815.0	165,878	90,441	38,230	40.60
Transcontinental & Western Air, Inc.	3,149,014	54,683	43,845	727.0	429,572	207,282	73,446	59.70
United Air Lines, Inc.	4,037,277	102,444	64,871	1,123.0	449,242	491,383	96,500	67.22
Western Air Lines, Inc.	662,784	32,584	12,760	149.2	37,236	24,970	24,545	51.99
Total	22,573,678	726,986	378,515	6,752.2	2,105,627	1,569,405	628,110	60.26

[a] Revenue passengers carried is an unduplicated figure.

CAA Control Towers Equipped to Guard VHF Radio Channel for Private Pilot Use

Virtually all airport control towers of the Civil Aeronautics Administration are now equipped to receive calls from private aircraft on the very high frequency channel, 122.5 mc, assigned for plane-to-tower use by private pilots with VHF transmitters.

The pilot, with a VHF receiver, picks up the tower reply on one of four very high frequencies in present use—118.3, 118.5, 118.7, 118.9 mc.

The new frequencies assigned for private-pilot use in talking with tower controllers mark one phase in the changeover from the low frequency to the very high frequency system of radio communications between CAA ground stations and civil aircraft, now taking place on the Federal Airways.

With the entire program in the transition stage, the CAA is maintaining use of low frequencies as well as very high frequencies where necessary, and has also put into operation several interim measures until the changeover is completed.

Private pilots, for instance, who do not yet have VHF radio equipment in their planes can call the tower as usual and receive replies on the 200-400 kc band.

En Route Frequencies for Private Planes—For en route VHF communications between private planes and airways communications stations, all CAA stations will stand guard on the 122.1 mc frequency when installation of the VHF equipment is completed. Fifty-one stations were guarding 122.1 mc on Feb. 21, and by July 1 the CAA expects to have the majority of the stations equipped to handle this frequency.

The ground-to-plane frequency, 111.1 mc, is being installed at 214 stations selected for the best coverage of the airways. This frequency will be used for replies to private planes along the airways until the installation and commissioning of VHF omni-directional ranges with voice feature. After transition of the CAA range system to very high frequencies, 111.1 mc will be retained where necessary to provide a secondary or overflow frequency for use in conjunction with the range voice channel. Except in congested areas, CAA communications stations will continue broadcasting on the voice channel of the VHF radio ranges.

Air carrier aircraft and ground stations are, for the most part, carrying on communications on an interim set-up at present. The following paragraphs outline the present system and the very high frequencies which air carriers will be using ultimately.

Air Carrier-Tower Operations—As an interim measure, air carriers and towers will be on the same frequency (118.3, 118.5, 118.7, 118.9 mc) due to present airborne equipment limitations which prevent cross-band communications. The CAA expects to establish separate tower and aircraft frequencies before July 1, 1950, with air carriers using frequencies in the 125.7 to 126.5 mc band.

A system for assigning very high frequencies to airport traffic control towers on a sequence basis, using 17 channels in the 118.1 through 121.3 mc band, will be put into effect, probably sometime after July 1, 1947.

The frequency 118.1 mc is set aside primarily for use at towers handling international traffic and will be assigned to such towers in addition to one of the other 16 frequencies. This frequency is now in use at several towers in the North Atlantic area.

Airport Utility Frequency—The utility frequency, 121.9 mc, will be provided at each CAA airport control tower for two-way communications between the tower and aircraft and vehicles on the airport and between airport vehicles. Since other VHF installation work has been given higher priority, the completion of this program is not expected before July 1, 1948. The CAA tower at Burbank, Calif., is now using 121.9 mc and the CAA expects that several more towers will be prepared to handle two-way contacts on the utility frequency in the near future. The dates will depend upon availability of crystals for transmitters which are already installed.

Approach Control Towers—Approach control towers, as an interim measure, are issuing approach control instructions to all aircraft on the voice feature of the low frequency ranges, or on one of the four very high frequency channels in use, depending on the equipment in the aircraft. Ultimately, these instructions will be issued by control towers on the simultaneous voice feature of the instrument landing system localizers in the 108-112 mc band. Ten channels in the 123.7 to 125.5 mc band have been set aside for use by aircraft to transmit to approach control and will be activated as equipment permits.

Air Carriers to Airways Communications Stations—Air carrier aircraft will use the frequency 126.7 mc for communication with CAA stations as soon as airborne equipment becomes available. A definite date for establishing receiving watches on 126.7 mc at CAA stations has not yet been determined. As an interim measure, and until approximately July 1, 1948, there will be a limited two-way use of 116.1 mc by air carriers and stations as a supplement to 3117.5 kc. Air carriers may use the VHF channel as a secondary en route frequency when communications on 3117.5 kc are difficult, as, for instance, when severe precipitation static conditions prevail.

Communications Stations to Air Carriers—When equipment is available to permit general use of 126.7 mc by air carriers, en route communications will be on a cross-band basis with CAA stations using the voice channel of the VHF radio range or 111.1 mc.

The CAA publication "Airman's Guide" is a source of information concerning the very high frequency radio program at CAA towers and stations. This publication will list the new VHF services available at individual locations in the first edition following the activation or installation of VHF facilities. The publication is on sale at the Government Printing Office. Yearly subscription for 26 issues of the "Airman's Guide," and two editions of the "Flight Information Manual," is $7.50.

Sales of Aircraft Engines In 1946 Total $127,000,000

Aircraft engine manufacturers did 127 million dollars worth of business last year—approximately one-third as much as the aircraft manufacturers.

Aircraft engine production during 1946 totaled 43,407 units, valued at $126.9 million (excluding experimental engines classified as secret or confidential by the armed forces, as well as engines for pilotless aircraft and jet-assist mechanisms). In the same period, 36,204 airplanes, valued at $363 million were produced.

Military customers received 2585 engines, valued at $70.6 million, and all other customers received 40,822 engines, valued at $56.2 million. The average unit value of the military engines was $27,328 as compared with $1377 for non-military engines.

December 1946 employment at plants manufacturing aircraft engines amounted to 27,754 persons, of whom 19,639 (71%) were production and related workers. In the same month, plants building complete aircraft had a total payroll of 155,759 persons, including 109,975 production and related workers.

Engines of less than 250 horsepower accounted for 38,527 or 88 percent of total 1946 shipments. The 1946 record shows:

By rated power:[1]	
0-249 hp reciprocating	38,527
250 hp and up reciprocating Non-reciprocating	4,880
By cylinder arrangements:	
Radial	4,073
Other (horizontally opposed, "V", non-reciprocating)	39,334

[1] Maximum take-off hp at sea level.

Transatlantic Travel Analysis

The CAB has issued an analysis of New York City traffic making air trips across the Atlantic during 1946. The title of the report is "Analysis of Transatlantic Passenger Traffic, outbound from and inbound to New York City via scheduled air carriers."

CAA and CAB Releases

Copies of CAA releases may be obtained from the CAA Office of Aviation Information. CAB releases are obtainable from the Public Information Section of the Board. Both offices are located in the Department of Commerce Building, Washington 25, D. C.

Administration

CAA Accepts First Castered-Wheel Landing Gear Plane. (March 2)

CAA Advisory Committee Meeting Set for March 4. (March 2)

Ten Mayors to Study Airport, Airway Facilities on Trip. (March 3)

Southeastern States Plan Aviation Forum Meetings. (March 10)

CAA Developing Radar Flying Aids Improvements. (March 11)

Facilitation Committee to Study Airports of Entry in Southwest and West Coast Areas. (March 10)

CAA Reduces Fees for Certification of Aircraft. (March 14)

CAA to Train Philippine Boys in Air Traffic Control. (March 17)

Young Fly, the Old Do Not, CAA Age Survey Shows. (March 18)

New Methods Make Airports Quieter Neighbors, CAA Says. (March 23)

CAA Proposes Inexpensive Small Airport Marker System. (March 25)

Frequency Named for Emergency Civilian Use of Military GCA. (March 26)

Board

Statistics—Financial for first 11 months of 1946. (Feb. 27)

Statistics—Mileage and traffic for 1946. (Feb. 27)

Pan American Airways Show Cause Order. (March 21)

Radar Aids

(Continued from page 37)

airport tower. It operates on the familiar radar principle of reflected signals from airplanes or other objects, and these signals produce a spot of light on the radar screen. Thus, the operator on the ground can direct the pilot as he approaches and lands, instructing him to turn to right or left and up or down in order to maintain a proper directional approach and let-down rate. Pilots making approaches on the three-element radio instrument landing system, now ready at 35 major airports, thus will have GCA operators on the ground monitoring their approaches. They will be told their position with relation to the established glide path and localizer path for that particular airport and, in emergencies, given radar aid in landing. In addition, they can ask for whatever other information and aid the GCA operator is equipped to give.

The MEW equipment has a range of about 125 miles. The scanning antenna is mounted on a small hilltop near the airport, and airplanes as far away as Harrisburg, Norfolk, Philadelphia and Richmond will be "visible" through the light spots which they produce on the screen.

ILS in Operation

(Continued from page 37)

(Love); Dayton, Ohio; Denver, Colo.; Eugene, Ore.; Ft. Worth, Tex. (Meacham); Grand Junction, Colo.; Indianapolis, Ind.; Jackson, Miss.; Jacksonville, Fla.; Kansas City, Mo.; Knoxville, Tenn.; Las Vegas, Nev.; Memphis, Tenn.; Minneapolis, Minn.; New Orleans, La.; Newark, N. J.; New York, N. Y.; Oklahoma City, Okla.; Omaha, Nebr.; Oakland, Calif.; Raleigh, N. C.; Salt Lake City, Utah; San Antonio, Tex.; Tulsa, Okla.; Washington, D. C.; Wichita, Kans., and Reading, Pa.

CAB Safety Bulletin Gives Do's and Don't's For Pilots Landing on Unfamiliar Fields

Do's and Don't's for pilots landing on fields with which they are not familiar are given by the CAB Safety Bureau in the latest Safety Bulletin, "Strange Field Landings."

The text of the Safety Bulletin follows:

Extensive surveys have brought to light interesting points on landing in fields unfamiliar to the pilot. Airmen of all degrees of experience were asked what they considered of primary importance on the subject. Their answers fell into a remarkably uniform pattern and showed several major factors, all requiring foresight, vigilance, and alertness, if trouble is to be avoided.

Here is the consensus of the most important do's and don't's when landings at an established airport having no control tower:

1. Approach high enough to observe existing traffic without interfering with it. *Don't buzz the field!*

2. Should there be no traffic, get your landing direction from the wind tee, wind sock, or whatever wind-indicating device is in use, but conduct your entire approach with the constant thought that other traffic may develop. *Don't consider the field your private airport!*

3. Although most fields have left-hand traffic, local conditions sometimes make the reverse necessary. Any time you plan to land at either of two nearby fields, remember that one or the other may have right-hand traffic and that the direction of circling is sometimes interchanged between the two with different winds. *Don't get into the traffic level until you are sure which way traffic is going!*

4. Having learned the pattern in use, let down well away from it. Enter on the downwind leg at pattern altitude and the correct angle (usually 45°). *Don't barge in just anywhere merely because it is more convenient for you—remember aircraft already in the pattern take precedence over those entering!*

5. Once in the pattern, stick to it; make ample allowance for speed differences of other planes and the consequent possibility of overtaking someone or being overtaken yourself. *Don't cut anyone off!*

6. Watch for wires and other obstructions. *Don't assume that the approach is clear!*

7. Be alert continually. *Don't let pride show you up for a green pilot; should circumstances develop to add uncertainty to your landing—"give her the gun" and go around again!*

8. After landing, get off the runway when and where you should and stick to the ground traffic pattern. *Don't think for a minute that once on the ground all collision hazard is over!*

9. If you are taking off immediately, follow the ground traffic, wait your turn, not on the take-off runway but off and at right angles to it, and allow the plane ahead to get well away before you start your take-off. Just before take-off, take another look for planes coming in. *Don't cut off a landing plane; it's not only bad manners but that plane has right-of-way!*

10. If you are staying awhile, park where you won't inconvenience or jeopardize others. Most airports have parking lines—use them for their intended purpose and lock the brakes or chock the wheels! *Don't block ground traffic or taxi close enough to people to endanger or discomfort them.* There is no more discourteous or unnecessary act in flying than deliberately or thoughtlessly "blasting the prop" and dusting people. *Leave dusting to the crop dusters!*

These recommended "do's" and "don't's" are actually no more than common sense and courtesy. Yet records of the Safety Bureau show that a surprising number of pilots ignore them with costly and often tragic results.

By approaching high enough (at least 1500 feet recommended) you will be able to cross over the field and get a picture of ground conditions, including wind direction, without exposing yourself to collision. Conforming to the pattern, once in it, minimizes collision danger, as does realization that speed differences of aircraft can be very great—from a glider at 30 mph to a hot ship at 150 mph, even during its final approach. Lack of conformity by someone else in the pattern does not excuse the same thing in you. Even when you *know* you have legal right-of-way, don't insist on taking it to the extent of endangering yourself and others. Any time saved or personal satisfaction gained isn't worth it and there's always the chance that the other pilot hasn't seen you. There are more solo students in the air than ever—don't expect them to cope with an emergency as well as you can.

On your first visit to a field you may be forgiven a local traffic irregularity but certainly not any air or ground discourtesy. On your second visit, however, or your first take-off, you will not be forgiven for once on a field it is up to you to acquaint yourself with local customs and traffic patterns. Any experienced pilot will tell you there is no place in modern aviation for the "rugged individualist" who believes the sky is his alone. Safety in flight is largely a matter of respecting the rights of the other pilot. Make the Golden Rule a part of your personal air conduct.

When landing at a field where traffic is controlled by a tower, you are, of course, under guidance of the control-tower operator and must conform to any instructions from the tower.

"Cow-pasture" landings on farms or fields other than established airports present an entirely different problem. It's always smart, if you want to keep out of trouble, to drag the field and take a good look before attempting to land. Be sure there is enough room, not only to get into but to get out of; many pilots have been badly and expensively fooled on the latter. Watch for obstructions, ditches, etc., and the condition of the ground. Never forget that wires are deadly, mainly because they are hard to see at any distance; a soft, muddy surface can make a dangerous runway, and a ditch is a costly place to stop your landing roll. While dragging the field, however, be constantly alert to the speed and attitude of your plane. Far too many stall-spin crashes, usually fatal or serious, occur to pilots concentrating on ground objects to the exclusion of flying the airplane.

The Civil Aeronautics Administration issues two books invaluable to airmen. All pilots should be familiar with them and a good many are. One, the Airman's Guide, is kept continually up to date by reissues every two weeks; the other, Flight Information Manual, is published twice a year. These books are virtually the cross-country pilot's Bible. Only a very little time spent consulting that part describing the airport you're going to, as well as those en route, can pay heavy dividends.

(The Airman's Guide and Flight Information Manual are on sale by the Superintendent of Documents, Government Printing Office, for 30 and 15 cents a copy, respectively. Yearly subscription price for both together is $7.50.)

Safety Bulletin No. 176-47, reprinted above, is available in pamphlet form at 5 cents a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Accident Reports . . . Civil Aeronautics Board

Pilot Shortcomings Blamed—In its report on the crash of the Viking Air Transport, a non-certificated carrier, near Richmond, Va., May 16, 1946, the CAB gives as the probable cause, the inability of the pilot to maintain adequate control of the aircraft to effect an emergency single-engine instrument approach under adverse weather conditions.

Contributing factors given were: The decision of the pilot to continue the flight into weather conditions which he considered unsafe; the negligence of the pilot in failing to have an inspection of the aircraft engines made prior to departure from Richmond; the action of the pilot in shutting down the wrong engine when experiencing excessive vibration from a powerplant, and the pilot's neglect in failing to retract the landing gear during an emergency go-around.

The crash occurred while the carrier was attempting to locate Byrd Field for an emergency landing under extremely marginal weather conditions. All 27 occupants of the plane were fatally injured.

The Board found that some doubt existed in the minds of the crew as to the airworthiness of the plane prior to departure from Richmond. The captain also permitted himself to be persuaded by the less experienced co-pilot to undertake the flight when worse weather was forecast at both Richmond and the destination, Atlanta.

The right engine had been operating somewhat roughly prior to departure. Unknown to the crew, however, a crack had been developing in the No. 6 cylinder head of the left engine, and, shortly after take-off the cylinder head evidently fractured completely.

The Board concluded that the right engine was shut down and the plane was attempting to re-land on the airport with only the faulty left engine operating.

Struck House on Flying Spree—Bobby T. Pirkle, 23, was killed when he crashed into a house at Fort Worth, Tex., November 23, 1946. The plane, owned by Southwest College of Aeronautics, was destroyed by impact and fire and the house was extensively damaged. Pirkle, a G. I. flight trainee at the College, had flown approximately 81 hours and was certificated as a private pilot.

Following an evening with several fellow students, during which a quantity of liquor and beer was consumed, Pirkle decided to make a flight. He drove to Meacham Field with two boy friends, each of whom refused to accompany him on a flight over the city. Without authorization, he took one of the school's night flying trainers, which was tied down near the hangar, and took off after one of his friends started the engine for him. For approximately 30 minutes the plane was observed diving and zooming at an extremely low altitude over a residential area of Fort Worth. While flying very low in a southerly direction it struck the roof of a one-story residence, remained on the collapsed roof and burned.

No evidence was found of any mechanical failure or malfunctioning of the aircraft prior to the accident. Weather conditions were good. This flight was not authorized by Southwest College of Aeronautics and Pirkle's friends stated that they tried to dissuade him from making it. He had stated he was going to dive low over the home of a girl friend. However, none of his friends resided in the house struck by the aircraft.

Mistook Train Lights for Runway—Mistaking the lights on a slow-moving train for runway lights, Pilot Elbern M. Calvert and his troupe of 15 crashed near Nashville, Tenn., January 1. Calvert used the aircraft to transport equipment and members of his show from one theatrical engagement to another. They had completed an engagement in Richmond and were scheduled for a performance in Nashville that night.

The visibility was three-sixteenths of a mile at Nashville, and the ceiling was 100 feet, but Calvert requested permission to land, stating his fuel supply was not sufficient to go elsewhere. The flight encountered rain with icing conditions, after taking off in light rain and fog from the Richmond Municipal Airport.

Shortly after receiving approach instructions from the Nashville Control Tower, the left wing of the plane struck trees 20 feet high, 1½ miles southwest of the field.

The plane slid along on its fuselage into a residence, injuring Mrs. Virdie Hill who was washing dishes in the kitchen. It came to rest approximately 100 feet beyond the house. The landing gear was wiped off when it struck the ground.

The runway lights of the field were on at the time of the crash, but with visibility restricted, the pilot could not see them.

Investigation revealed that the fuel tanks contained more than 200 gallons of fuel. Calvert stated that although he left Richmond with 600 gallons of gasoline, his fuel gauges "were reading practically empty", and he thought a landing at Nashville more advisable than attempting to go on.

Calvert was certificated as a private pilot with a multi-engine rating and had flown approximately 2000 hours. He was not rated as an instrument pilot.

Overloaded Plane Crashes—William H. Kelly, Carl Heck, and Leeman Riddle, all of Anchorage, Alaska, were killed when they crashed in adverse weather near Rainy Pass, Alaska, October 19, 1946. Kelly was a commercial pilot rated to fly single-engine land and sea planes and had flown approximately 520 hours.

Pilot Kelly, accompanied by Heck and Riddle who had chartered the plane for a flight to a small lake near Farewell, Alaska, approximately 160 miles northwestward, took off from Lake Spenard-Hood, Anchorage. The only radio contact with the flight was when the pilot filed a flight plan immediately after take-off. There were no witnesses to the crash and the wreckage was not found until the following day. A CAA Airways Flight Inspector, on a flight from McGrath to Anchorage the morning of October 19, was forced to turn back because of weather and stated that conditions were such that it would have been impossible to fly through Rainy Pass which was completely blocked with fog and snow.

Investigation revealed that the aircraft flown by Kelly was overloaded by approximately 660 pounds when it departed from Anchorage and that gasoline consumption had reduced the overload to about 480 pounds at the time of the crash.

Stalls in Gusty Wind—Gordon Doan Bigum and two revenue passengers, Eugene C. Robinson and David Wilson, were killed when they crashed near Drexel, Mo., October 13, 1946. The plane owned by Clinton Airways, was destroyed by impact and fire. Bigum, a former pilot with the U. S. Army Air Forces, was certificated as a commercial pilot and flight instructor and had flown approximately 900 hours.

Bigum was engaged in carrying passengers for local flights from a large meadow near Drexel and had made several uneventful flights. On the last flight he took off with passengers Robinson and Wilson. Take-off was toward the south into a gusty wind of approximately 25 mph. After climbing steeply to an altitude estimated as 150 feet, the aircraft apparently stalled and dived to the ground, striking a large ditch at an angle of about 30 degrees.

Examination of the wreckage indicated that considerable power was being developed at the time of impact. No evidence was found of malfunctioning of the aircraft prior to the accident and a pilot who flew it the morning of the crash reported that it was functioning normally at that time.

Coyote Chase Fatal—While maneuvering at a low altitude, chasing a coyote, Pilot Robert Lee Ginther, 41, and a passenger, Arthur Stadum, 25, were killed when the plane was stalled and crashed in an almost vertical attitude. Fire followed immediately.

The crash occurred near Baltic, S. Dak., January 9, in a plane recently purchased by the pilot. It was reported that he took off on the coyote hunt from Sioux Falls without removing an accumulation of frost from the aircraft wings.

Ginther was certificated as a private pilot and had flown approximately 250 hours.

Aviation Experts To Be Instructors At Air Institute

Outstanding government and industry experts in aviation will make up the faculty at the 31-day Air Transportation Institute being offered April 22 through May 22 by the American University in Washington, D. C.

The institute is being given in cooperation with the Civil Aeronautics Administration and the Air Transport Association of America, and is designed to give executives and students in various aviation fields a broad knowledge of the nation's air transportation system.

Special evening features of the institute will be addresses by nationally known experts. T. P. Wright, Administrator for Civil Aeronautics, will present "The Role of Government in Promoting Civil Aviation." Oswald Ryan, Vice Chairman of the Civil Aeronautics Board, will speak on "International Air Transportation Policy," and Admiral Emory S. Land, President of the Air Transportation Association of America will give an address on "The Outlook of Air Transportation."

Daytime courses, covering 22 different phases of air transportation, will be presented by officials of the CAA, CAB, Weather Bureau, National Aviation Organizations, and by airline executives and other industry experts.

Subjects of the courses to be given by CAA and CAB officials follow:

"The American Air Transportation System," David W. Bluestone, Chief Analyst, CAB Analysis Division.

"Airports," Hervey F. Law, Airport Administrator, and Paul F. Steiner, Assistant Administrator, Washington National Airport.

"Operation of Federal Airways," Charles W. Carmody, Acting Chief, CAA Air Route Traffic Control Section.

"Maintenance of Equipment," A. F. Notley, Chief, CAA Scheduled Air Carrier Maintenance Division.

"Government and Air Transportation," William C. Burt, Head of CAB Rates Section; Louis W. Goodkind, Assistant Director, CAB Economics Bureau; Emory T. Nunneley, Jr., General Counsel, CAB; Warner H. Hord, Chief, CAB Rates and Audit Division; and Richard E. Elwell, General Counsel, CAA.

"Public Relations," Ben Stern, Assistant Administrator for Aviation Information, CAA.

"Aviation Education," H. E. Mehrens, Chief, CAA Aviation Education Division.

"International Air Transportation," Harold A. Van Dorn, Chief, CAB Foreign Air Transport Division.

Airline Orders

E-315 orders investigation of PCA's operations between Pittsburgh and New York-Newark to determine if carrier has violated any provision of the Act or failed to comply with the terms of its certificate. (Feb. 19)

E-316 permits Southwest Airways Company to begin service on March 1 to San Jose, Calif., through use of Moffett Field. (Feb. 20)

E-317 allows Toledo Chamber of Commerce, and Toledo, Ohio, to intervene in TWA and Delta agreement proceeding relating to interchange of equipment—Docket 2346. (Feb. 20)

E-318 reinstates application of Pioneer Intermountain Airways. (Feb. 21)

E-319 dismisses application of Standard Airlines in Air Freight Case, and permits the Department of Agriculture and Colonial Airlines to intervene in the Air Freight proceedings. (Feb. 21)

E-320 approves agreement between Pan American Airways and Pan American-Grace Airways relating to lease of office space in New York. (Feb. 24)

E-321 permits British Commonwealth Pacific Airlines to begin service to Honolulu on February 24 through use of the John Rogers Airport, and to San Francisco on February 26 through use of the Oakland Municipal Airport. (Feb. 24)

E-322 permits British Commonwealth Pacific Airlines to begin service to Canton Island on February 24 through use of the U. S. Army airfield (Topham Field) subject to the approval of the War Department. (Feb. 25)

E-323 consolidates applications of Matson Navigation Co., Pan American Airways, Northwest Airlines and Transocean Air Lines for direct air service between the Pacific Northwest and the Hawaiian Islands into one proceeding. Permits United Air Lines; Pacific Overseas Airlines; U. S. Maritime Commission; Department of the Interior; the Cities of Tacoma and Seattle, Wash., and Medford and Portland, Oreg.; the Ports of Tacoma, Seattle and Everett, Wash., and Portland, Oreg.; Pierce County, Wash.; and the Chambers of Commerce of Longview and Seattle, Wash.; to intervene in the proceeding. (Feb. 25)

E-324 dismisses, upon applicant's request, application of Hansel Chang d.b.a. Pacific Travel Bureau. (Feb. 26)

E-325 grants permission to Pan American Airways to begin service to Accra, Gold Coast, Africa, on March 3, through use of the Accra Civil Airport. (Feb. 27)

E-326 orders that authorized Board employees be allowed to examine accounts, records, and memoranda kept by TWA, during the investigation of transactions between Hughes Tool Co., and TWA—docket 2796. (Feb. 27)

E-327 orders that authorized Board employees be given access to any correspondence, records, etc., of the Hughes Tool Co., which might have bearing upon its relations with TWA since Oct. 17, 1944, when it acquired control of the carrier through stock ownership. (Feb. 27)

E-328 permits American Airlines and the Post Office Department to intervene in the All American Aviation proceeding—docket 2366. (Feb. 27)

E-329 dismisses application of National Airlines and Caribbean-Atlantic Airlines for a temporary exemption order involving the National-Caribbean Atlantic Control Case, since this case has been decided. (Feb. 28)

E-330 modifies certificate of Empire Airlines to permit one daily round trip between Spokane, Wash., and Boise, Idaho, via Coeur d'Alene, Pullman-Moscow, and Lewiston-Clarkston, Idaho, in addition to two daily round trips serving each point on carrier's route. (Feb. 28)

E-331 defers until after decision in the Arizona-New Mexico Case the decision on the joint application of Arizona Airways, TWA and H. O. Nelson approval for the transfer of TWA's certificate for route 38 to Arizona Airways—issued with opinion. (Feb. 19)

E-332 fixes Pioneer Air Lines' temporary base rate of mail pay at 35 cents per airplane mile. (March 3)

E-333 permits Pan American Airways to begin nonstop service between Dakar, French West Africa and Accra, Gold Coast. (March 3)

E-334 permits the Chambers of Commerce of New Iberia, La., and Fort Worth, Tex., the City of Alexandria, La., and Texas-New Mexico Airlines to intervene in the Mississippi Valley Case. (March 3)

E-335 fixes the temporary base rate of mail pay for Florida Airways at 35 cents an airplane mile. (March 3)

E-336 allows Northwest Airlines to begin nonstop service between La Crosse, Wis. and St. Paul, Minn., on March 2. (March 3)

E-337 directs Chicago and Southern to show cause why the Board should not fix its base rate of mail for the New Orleans-Havana segment of its Latin American route at 95 cents an airplane mile. (March 3)

E-338 orders an investigation to determine if Chicago and Southern's certificate on its Latin American route, with the exception of service between New Orleans and Havana, should be suspended until further order of the Board. (March 3)

E-339 grants temporary approval, until final order in proceeding, to agreement (CAB No. 698) between 13 air carriers relating to the establishment of a consolidated air freight tariff and authorizing discussions of rates and other matters. (Feb. 24)

E-340 grants temporary exemption permitting E. W. Wiggins Airways to serve Norwood, Mass., in lieu of Brockton and Taunton, Mass., as an intermediate stop on segment 4 of route 79 between Boston and Providence. (Feb. 25)

E-341 permits E. W. Wiggins Airways to suspend service temporarily at Bennington, Vt., Framingham, Southbridge, Northhampton, Pittsfield, Brockton and Taunton, Mass., provided Wiggins serves Norwood in lieu of Brockton and Taunton on each flight between Boston and Providence on segment 4 of route 79; denies request for temporary suspensions of service at Lowell, Greenfield and Adams-North Adams, Mass. (Feb. 25)

E-342 orders that the temporary certificate of public convenience and necessity previously issued to Thomas E. Gordon d.b.a. Orlando Airlines be reissued in the name of Florida Airways, Inc. (March 7)

E-343 authorizes Pan American-Grace Airways to suspend service at Uyuni, Bolivia, for one year. (March 7)

E-344 permits Continental Air Lines to serve Midland-Odessa, Tex., through the Midland Army Airfield in place of Midland, Tex.; removes the three-year limitation from service between Hobbs, N. Mex., Midland, Big Spring, San Angelo and San Antonio, Tex.—issued with opinion. (March 7)

E-345 permits National Airlines to begin nonstop services between Norfolk, Va. and Wilmington, N. C., on March 10. (March 10)

E-346 grants San Antonio, Tex., permission to intervene in the Mississippi Case. (March 10)

E-347 dismisses upon request, application of Pan American-Grace Airways for stops at Salta, Argentina and Yacuiba, Bolivia. (March 11)

E-348 denies petition of New Orleans that Board set aside dismissal order E-244 and reconsider its complaint in the Latin American Case. (March 11)

E-349 permits Pan American to begin nonstop services between London and Istanbul, Turkey, and between Istanbul and Karachi, India on March 15. (March 11)

E-350 allows Pan American to serve Istanbul, Turkey, through use of Yesiloky Airport. (March 11)

E-351 permits Chamber of Commerce of Puerto Rico to intervene in the proceedings concerning applications of Caribbean Atlantic, Pan American and Chicago and Southern. (March 11)

E-352 dismisses application of Caribbean Atlantic for a temporary exemption order allowing it service between San Juan, Puerto Rico and Borinquen Field, Puerto Rico. (March 12)

E-353 permits Chamber of Commerce of Tacoma, Wash., to intervene in the Pacific Northwest-Hawaii Service Case. (March 12)

E-354 authorizes United Air Lines to serve Twin Falls, Ida., through use of the Gooding Municipal Airport until the Twin Falls Airport becomes adequate for use by DC-3 aircraft. (March 13)

E-355 reopens proceedings in dockets 156 and 289 for the purpose of determining whether the public interest will be adversely affected by the continuance of interlocking relationship existing by reason of La Motte T. Cohu holding the positions of Director of TWA and Director of Northrop Aircraft, and whether order 403 approving such relationships should be revoked. (March 13)

E-356 allows Southwest Airways to schedule extra flights over part of its route, from San Francisco to Marysville, via Vallejo and Sacramento, in addition to its two daily round trips serving each point on segment 2 from San Francisco to Medford, Oreg. (March 13)

E-357 fixes Empire Air Lines' temporary mail pay at the base rate of 35 cents an airplane mile. (March 14)

E-358 fixes Southwest Airways' temporary mail pay at the base rate of 35 cents an airplane mile. (March 14)

E-359 sets mail pay of West Coast Airlines at the base rate of 35 cents an airplane mile. (March 14)

E-360 consolidates with Caribbean Atlantic, Pan Am. and Chicago and Southern proceeding (dockets 2246, 2170 and 2684) petition of Caribbean Atlantic (docket 2526) that Charlotte Amalie be eliminated as an intermediate point on Pan Am's Miami-South American route. (March 14)

E-361 denies motion of Pan Am to dismiss the petition by Caribbean Atlantic (docket 2526) and the request for permission to present oral argument in support of the motion, with the provision that carrier may renew motion without prejudice at the close of the hearing on the petition. (March 14)

E-362 approves agreement CAB No. 683 relating to resolution of the Air Traffic Conference of America on publication of scheduled time. (March 14)

E-363, E-364, E-365, E-366, E-367 and E-368 dismiss upon request of the applicant Pacific Air Lines' applications for various U. S. and overseas routes. (March 14)

E-369 modifies the condition in Wiggins Airways' certificate that each point be served on each trip over each segment of the route by permitting carrier to continue on from its Springfield, Mass., terminal on segment 4 to Albany, N. Y., over a portion of segment 3. (March 17)

E-370 orders Trans-Caribbean, non-certificated carrier operating from New York City to San Juan, Puerto Rico, Miami and Los Angeles, to cease scheduled air transportation. (March 14)

E-371 exempts American from restrictions in its San Antonio service which would prevent it from operating exclusive cargo flights both ways between San Antonio and Monterrey or Mexico City or both. (March 18)

E-372 dismisses application of Alaska Airlines filed Aug. 15, 1946. (March 18)

E-373 institutes an investigation with respect to the finances, routes and operations of Colonial Airlines and directs Colonial to submit a report on these matters within 30 days. (March 18)

E-374 directs Colonial Airlines to show cause why the Board should not fix certain temporary rates of compensation for mail transportation over Colonial's entire system, with the exception of its Bermuda routes, on and after Apr. 15, 1946. (March 18)

E-375 institutes an investigation with respect to the finances, routes and operations of Northeast Airlines and directs Northeast to submit a report on these matters within 30 days. (March 18)

E-376 fixes the temporary rate of compensation to be paid Northeast Airlines for mail transportation for the period from May 1, 1945 to February 28, 1947 and for the period beginning Mar. 1, 1947. (March 18)

E-377 dismisses joint applications of S. N. Drum and Nathan R. Kobey with Colorado Airlines for approval of certain interlocking relationships. (March 18)

E-378 dismisses joint application of Alaska Airlines and Raymond W. Marshall for approval of interlocking relationships. (March 18)

E-379 approves an agreement (CAB No. 712) between American Airlines and TWA relating to maintenance of Administration Building at Sky Harbor Municipal Airport, Phoenix, Ariz. (March 19)

E-380 approves an agreement (CAB No. 733) between Chicago and Southern Air Lines and Pioneer Air Lines relating to joint ticket office at Houston, Tex. (March 19)

E-381 rescinds order E-373 which temporarily suspended service by Southwest Airways Co. at Fort Bragg, Calif. (March 19)

E-382 permits Pan American Airways to inaugurate on or about March 21, nonstop service between Boston, Mass. and Santa Maria, Azores. (March 19)

E-383 grants Colonial, National, Pan American, Pan American-Grace and Eastern Air Lines leave to intervene in the application of Peruvian International Airways for a foreign permit. (March 19)

E-384 authorizes British Overseas Airways Corp. to increase its flight frequencies to daily round trips between Baltimore, Md. and Bermuda for the period between Mar. 24, 1947 and Apr. 14, 1947. (March 20)

Airman Orders

S-59 modifies revocation of John Edward Kelsey's pilot certificate to a six-month suspension. While proceedings were pending against Kelsey's student certificate, he acquired a substantial number of solo hours and was issued a private certificate. (February 26)

S-60 revokes commercial certificate of William Latimer Small without placing a time limit upon his right to apply for a new certificate, since he has been grounded involuntarily for more than a year. This is a Board amendment to the initial examiner decision dismissing Administrator's complaint that Small piloted an aircraft while under influence of intoxicating liquor. (March 11)

S-61 upholds examiner's order issued February 13 suspending airman certificate of Ernest William Goebel for six months. (March 11)

S-62 denies petition of Ray R. Copeland for a reduction of the revocation penalty ordered by the Board, Dec. 27, 1946. (March 11)

S-63 rules that Graydon H. Tucker may be issued a parachute technician certificate with a senior parachute rigger grade on the basis of his Army experience and rating. (March 20)

SD-146 suspends for six months commercial certificate of Gaddis Gibson Hall. He flew at 20 to 50 feet over the Mississippi State College Campus at Starksville, Miss., thus breaking the altitude rules over congested areas. He also performed aerobatics when neither he nor his passenger had parachutes. (January 29)

SD-147 suspends for six months commercial certificate of Andrew Duane Frink. While carrying four passengers in instrument weather, he piloted an aircraft within the control area near The Dalles Municipal Airport, Oregon, without filing a flight plan or obtaining a traffic clearance—60.250 and 60.252; and flew in instrument weather without an instrument rating—43.65. (February 18)

SD-148 revokes airman certificate of Theodore Kenneth Starkey. He flew at altitudes between 40 and 100 feet, circling houses and bathers at De Carlos Pond, Springfield, Mass., and crashed into the pond injuring his passenger. (January 14)

SD-149 suspends for 90 days private certificate of Maurice E. Barrett. While flying in the airway traffic control area and airport traffic control zone at Atlanta, Ga., he violated the proximity-to-clouds minimums of 60.110. Neither center nor tower cleared him to fly at less than the distance specified. (January 27)

SD-150 revokes student certificate of Jack Howard Roberts for careless, reckless flying. He flew over Memphis, Tenn., at 100- to 400-foot altitudes—60.105(a) and executed acrobatics, including banks, shallow dives, slow dives, twists and turns which resulted in either extreme slips or skids—60.104(b). (February 4)

SD-151 revokes commercial certificate of Edward Frank Seidel for careless and reckless flying. He piloted an aircraft at night over Zahn's airfield, and Amityville and Lindenhurst, N. Y., while both he and his passenger were under the influence of intoxicating liquor—43.406, and flew at from 200 to 300 feet—60.105(a) and (b). (February 21)

SD-152 dismisses complaint against John Shirley Long, private pilot. (January 16)

SD-153 suspends for six months student certificate of Ralph Calvin Zirkle. He flew outside the local flying area when he did not have 10 solo hours, had not passed the written test, and his certificate was not endorsed by his instructor—43.52(a) (b) and (c). He also flew so low near Timberville, Va., that he struck wires and crashed—60.105(b) and 60.101. (February 21)

SD-154 suspends for six months student certificate of Robert Graham Davidson. He was observed by a New York State trooper flying at about 300 feet over Fonda, N. Y., and executing wingovers and vertical banks. Arraigned before a justice of peace, he pleaded guilty and was fined $25. (February 21)

SD-155 suspends for 15 days commercial certificate of David Kingsley Gossier for performing aerobatics near Wings Field, Ambler, Pa., when neither he nor his passenger had parachutes—43.409. Gossier stated that it was his understanding that parachutes were not required under the new regulations. (February 25)

SD-156 revokes private certificate of Jones Robert Williams. He flew an aircraft at night near Fitzgerald, Ga., when aircraft was not certificated for night flying—43.1010; plane did not have forward and rear position lights—43.30(b) (2) defendant and his passenger were under influence of intoxicating liquor—43.406; and he carried a passenger at night when he had not made at least five take-offs and landings within preceding 90 days—43.681. (February 25)

SD-157 suspends for six months student certificate of Ervin P. Voshell for operating an aircraft in a careless and reckless manner near Greensboro, Md. (February 25)

SD-158 suspends for six months commercial certificate of Franklin Caldwell Houser, Jr. for low flying along Jacksonville Beach, Fla., and for imperilling life of his passenger and the aircraft belonging to another. (February 25)

SD-159 suspends for 60 days commercial certificate of William Forrest Marsh for flying aerobatically without parachutes while carrying passengers. (February 25)

SD-160 revokes student certificate of Henry Clay Raine, Jr. He took off at night from the Three B's Airport at Fitzgerald, Ga., in a plane not equipped with position lights—43.30(b) (2) and restricted to daytime operations—43.1010; carried a passenger at night without the required recent experience in take-offs and landings—43.681; and was under influence of intoxicating liquor. In attempting to land he collided with his own car parked near the airport, and in a second approach attempt he crashed near the field. (March 6)

SD-161 revokes student certificate of Leonard Raymond Linder. He carried a passenger (43.50) on flight near Houston, Tex.; struck a high tension wire while attempting to land; and did not make a written report of the accident to the nearest CAB branch office—01.30. (February 27)

SD-162 suspends for six months student certificate of Elmer Franklin Smith beginning Aug. 28, 1946, when defendant surrendered certificate. He piloted plane outside of local flying area without permission of his instructor when he had less than 10 solo hours and had not passed written test. (February 26)

SD-163 dismisses complaint against Homer Anthony Cain, airline pilot, for violations committed two years ago. Examiner holds that since Cain is not responsible for delay in hearing and decision and has continued to fly as a transport pilot without further violations, it would be inequitable to suspend certificate now. (February 21)

SD-164 suspends for 30 days private certificate of June Camilla Diestler for copying three questions and answers from examination paper while taking written test for commercial certificate. (February 5)

SD-165 rules that public interest does not require any action to be taken on private certificate of Darwin Popow. Accompanied by an A and E mechanic in charge of maintenance and repair of the plane, he flew from Cecil to Almonesson, N. J., without carrying an airworthiness certificate for the plane or special CAA authorization. He stated that he believed the designated aircraft mechanic inspector at Almonesson had the authority to give permission for the flight. (March 1)

SD-166 suspends for three months private certificate of Richard William Pemberton for carrying a passenger, while he was a student pilot, from Montpelier to Bennington, Vt. Since the passenger was an experienced pilot and held a Canadian license which Pemberton believed valid in this country, and the defendant had 31 hours of flight time, examiner found that the fixed revocation policy for this violation should be relaxed. (Feb. 28)

SD-167 revokes student certificate of Joseph Daniel Gloria, PFC, for carrying a passenger on a flight at Red Bank, N. J. (March 1)

SD-168 suspends for six months private certificate of Lowell D. Boughton for operating an aircraft recklessly and endangering the life of his passenger. While flying at 75 feet above the ground at Parsons, Kans., he climbed steeply, stalled and crashed. (March 1)

SD-169 revokes student certificate of Howard Dale Hampsmire, after finding that he operated the plane carelessly and recklessly. He flew at three to 10 feet above the ground at a farm near New London, Mo., struck a fence on which a girl was sitting, resulting in her death. (March 10)

SD-170 suspends for 30 days student certificate of Aubrey Lee McGee for failing to conform to flow of traffic after take-off from Shannon Airport, Fredericksburg, Va. (March 4)

SD-171 revokes student certificate of defendant after finding that he did not meet physical requirements of the Civil Air Regulations. (Names are not made public in physical disability cases.) (March 4)

SD-172 revokes commercial certificate of Paul Gerhard Gutknecht and orders that he shall not be issued any rating higher than a private pilot before Feb. 5, 1948. He made several flights near Monticello, Iowa, without a valid medical certificate in his possession—43.402; failed to make a written report of an accident —01.30; flew an unairworthy plane cross-country—43.20, and flew aerobatically without parachutes while carrying a passenger—43.409. (Feb. 5)

SD-173 suspends for six months commercial certificate of Joseph Lee Baker, Jr., after finding that he executed at least four dives at an altitude as low as 50 to 60 feet over Galesburg, Ill. (March 14)

SD-174 revokes student certificate of Pete Gomez for carrying a passenger and for low flying over occupied dwellings at Phoenix, Ariz. (March 5)

SD-175 revokes student certificate of Walter Prodoehl for carrying a passenger on flight from Hales Corners, Wis. (March 5)

SD-176 suspends for six months student certificate of Henry Hatten Huey. He flew at an altitude of between 200 to 300 feet near an open air assembly of persons at the Asarco Mine, New Mexico, and crashed into telephone wires. Huey has been deprived of his certificate since Feb. 27, 1946. (Dec. 3, 1946)

SD-177 suspends for 30 days commercial certificate of Harlen Cornelius Bouman and until he passes written examination on Parts 20, 43 and 60. Bouman flew a rented plane aerobatically below required altitude. (Feb. 12)

SD-178 dismisses complaint against William Raymond Elmendorf on grounds that violations were not established. (Feb. 14)

SD-179 suspends mechanic certificate of Frederick Thomas Foley for four months for representing to the Administrator that an airplane was airworthy when it was not. (March 4)

SD-180 suspends for six months student certificate of John P. Ogletree for low flying over Oakland, Calif., and for flight outside of a local flying area without instructor's permission and the required 10 hours solo. (March 6)

No. SD-181 revokes airman certificate of Paul De Vaughn Lindsey. While a student pilot, he carried a passenger in violation of 43.50. (March 7)

No. SD-182 suspends student certificate of James R. Greenwood for six months because he flew over a congested area at an altitude of less than 1,000 feet, contrary to 60.105(a). Greenwood also violated the provisions of 60.105(b), 60.101 and 60.104(b). (March 7)

No. SD-183 revokes student certificate of Russell E. Gillaspie because he carried passengers for hire, in violation of 43.50. (March 8)

No. SD-184 suspends commercial certificate of James R. Budge for 90 days because he piloted an aircraft over a congested area at approximately 150 feet, contrary to 60.105(a). (March 7)

No. SD-185 revokes student certificate of Harley Dow Pierson because he carried a passenger, contrary to the provisions of 43.50. (March 7)

No. SD-186 revokes private certificate of Edward T. Moles because he flew at less than 1,000 feet over a congested area, contrary to the provisions of 60.105(a). Moles also violated 60.105(b), 60.104(b) and 60.101. (March 4)

SD-187 suspends for 90 days commercial certificate of James P. O'Hearn because he flew over a congested area at an altitude of 250 feet, in violation of 60.105(a). (March 7)

SD-188 suspends for 90 days student certificate of Antonio F. Durao. He flew at a dangerously low altitude, over and in the immediate vicinity of an occupied dwelling, as a result of which he struck a telephone pole and crashed. Also, on this flight, Durao flew outside the local flying area designated by his flight instructor, when he had not flown at least 10 solo hours nor passed a written exam on the pertinent provisions of Parts 43 and 60 of the Regulations dealing with contact flight rules. His certificate had not been appropriately endorsed. The foregoing incidents were in violation of 60.101 and 43.52. (March 8)

SD-189 suspends for 6 months private certificate of Harvey T. Engen because he flew so low over a farm yard that he collided with a tree, thereby violating 60.101 and 60.105(b) which pertain to low, careless and reckless flying. (March 7)

Air Regulations . . . *on April 1, 1947*

Title	No.	Part: Price	Part: Date	Part: No. of Amendments	Manual: Price	Manual: Date	Manual: No. of Amendments
Aircraft							
Airworthiness Certificates	01	$0.05	10/15/42	2	None	None	.....
Type and Production Certificates	02	.05	7/1/46	1	$0.10	8/1/46	.....
Airplane Airworthiness—Normal, Utility, Aerobatic, and Restricted Purpose Categories	03[1]	.25	12/15/46	2	None	None	.....
Airplane Airworthiness	04a	.15	11/1/43	7	.45	7/1/44	2
Airplane Airworthiness Transport Categories	04b[1]	Free	11/9/45	4	None	None	.....
Rotorcraft Airworthiness	06	.10	5/24/46	.....	None	None	.....
Aircraft Airworthiness, Limited Category	09	.05	11/21/46	.....	None	None	.....
Engine Airworthiness	13	.05	8/1/41	.....	None	None	.....
Propeller Airworthiness	14	.05	7/15/42	1	.15	5/1/46	.....
Equipment Airworthiness	15	.05	5/31/46	.....	No stock	7/1/38	.....
Radio Equipment Airworthiness	16	.05	2/13/41	.....	Free	2/13/41	1
Maintenance, Repair, and Alteration of Aircraft, Engines, Propellers, Instruments	18	.05	9/1/42	.....	.50	6/1/43	.....
Airmen							
Pilot Certificates	20	.05	7/1/45	5	None	None	.....
Airline Pilot Rating	21	.05	10/1/42	3	None	None	.....
Lighter-than-air Pilot Certificates	22	.05	10/15/42	2	None	None	.....
Mechanic Certificates	24	.05	7/1/43	1[2]	None	None	.....
Parachute Technician Certificates	25	.05	12/15/43	3	None	None	.....
Traffic Control Tower Operator Certificates	26	.05	10/10/45	1	None	None	.....
Aircraft Dispatcher Certificates	27	.05	7/1/46	.....	None	None	.....
Physical Standards for Airmen	29	.05	1/10/46	.....	None	None	.....
Flight Engineer Certificates	35	Free	3/15/47	1	None	None	.....
Operation Rules							
Air Carrier Operating Certification	40	.10	7/10/46	[3]	None	None	.....
Scheduled Air Carrier Operations Outside Continental U. S.	41	.05	5/1/46	5[4]	None	None	.....
Nonscheduled Air Carrier Certification and Operation Rules	42	.05	8/1/46	5[4]	.15	11/1/46	.....
General Operation Rules	43	.05	7/1/45	8[5]	None	None	.....
Foreign Air Carrier Regulations	44	.05	7/1/45	1	None	None	.....
Transportation of Explosives and other Dangerous Articles	49	.05	7/1/45	.....	None	None	.....
Air Agencies							
Airman Agency Certificates	50	.05	4/30/46	.....	.15	5/15/46	1
Ground Instructor Rating	51	.05	12/15/43	1	None	None	.....
Repair Station Rating	52	.05	10/1/42	.....	Free	2/41	.....
Mechanic School Rating	53	.05	8/1/42	1	Free	5/40	.....
Parachute Loft Certificates and Ratings	54	.05	1/21/43	.....	None	None	.....
Air Navigation							
Air Traffic Rules	60	.05	8/1/45	2[3]	.15	10/45	.....
Scheduled Air Carrier Rules	61	.10	8/1/46	4[6]	None	None	.....
Miscellaneous							
Rules of Practice Governing Suspension and Revocation Proceedings	97	Free	1/1/47	1	None	None	.....
Definitions	98	.05	10/15/42	.....	None	None	.....
Mode of Citation	99	Free	11/15/40	.....	None	None	.....
Regulations of the Administrator							
Aircraft Registration Certificates	501	Free	3/31/43	.....	None	None	.....
Dealers Registration Certificates	502	Free	11/15/46	.....	None	None	.....
Recordation of Aircraft Ownership	503	Free	3/31/43	.....	None	None	.....
Notice of Construction or Alteration of Structures on or near Civil Airways	525	Free	7/23/43	.....	None	None	.....
Seizure of Aircraft	531	Free	12/8/41	.....	None	None	.....
Reproduction and Dissemination of Current Examination Materials	532	Free	1/15/43	.....	None	None	.....
Federal Aid to Public Agencies for Development of Public Airports	550	Free	1/9/47	.....	None	None	.....
Acquisition by Public Agencies for Public Airport Purposes of Land Owned or Controlled by the United States	555	Free	1/9/47	.....	None	None	.....
Claims for Reimbursement for Rehabilitation or Repair of Public Airports Damaged by Federal Agencies	560	Free	1/9/47	.....	None	None	.....

[1] Certain aircraft may comply with the provisions of this part or Part 04A. [2] Special regulations 340, 340A and 340B. [3] Special regulations 361A, 361B. [4] Special Regulation 385. [5] 43-1, 43-3, 43-5 are obsolete. [6] Special regulations 361A, 361B, 385.

Note: Those parts and manuals for which there is a price are obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Remittances should be by check or money order, payable to the Superintendent. Currency is sent at sender's risk. Amendments and free Parts are obtained from the Publications Section, Civil Aeronautics Board, Washington 25, D. C.; free Manuals and Regulations of the Administrator from the CAA Office of Aviation Information, Dept. of Commerce, Washington 25, D. C.

Regulations

Amdt. 03–2 ..... *Effective March 21, 1947*

Advances the effective date of section 03.0421 from March 15, 1947 to May 15, 1947.

Amdt. 04a–7 ..... *Effective March 21, 1947*

Advances the effective date of section 04a.040 from March 15, 1947 to May 15, 1947.

Amdt. 04b–4 ..... *Effective March 21, 1947*

Advances effective date of section 04b.0321 from March 15, 1947 to May 15, 1947.

(The amended sections 03.0421 and 04b.0321 and the new section 04a.040 were adopted Feb. 4, 1947, to provide for flight tests in addition to those specified in Parts 03, 04a and 04b if the Administrator considers them necessary to make certain that an airplane, its components and equipment are reliable and function properly.)

Amdt. 41–5 ..... *Effective March 24, 1947*

Amend Part 41 as follows:

41.321 Certificate. Effective September 15, 1947, each flight engineer shall hold a valid flight engineer certificate issued in accordance with the provisions of Part 35.

(This amendment will allow flight engineers until September 15 (six months) to take the examinations for a flight engineer's certificate required by the new Part 35 which went into effect March 15.)

Amdt. 61–4 ..... *Effective March 24, 1947*

Add the following sections to part 61:

61.56 Flight Engineer.

61.560 Certificate. Effective September 15, 1947, each flight engineer shall hold a valid flight engineer certificate issued in accordance with the provisions of part 35.

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CAA Gets Delivery on First Plane With Castered-wheel Landing Gear

The Civil Aeronautics Administration has accepted the first of three castered-wheel landing gear projects being developed to determine if airplanes can make safe cross-wind landings.

The completed castered-wheel gear, developed by the Fairchild Aircraft Division and installed on a Fairchild PT trainer, is one of the three installations the CAA has ordered for different types of planes.

Goodyear Gear Demonstrated—The castered-wheel landing gear developed for high-wing planes by the Goodyear Aircraft Corporation, under CAA contract, is nearing completion, and has been demonstrated to CAA officials. The new Goodyear gear is installed on a Piper J3.

The Firestone Aircraft Company is working on the third castered-wheel project using a tricycle landing gear plane.

The Fairchild plane was flown to Washington National Airport by Lloyd Child, Assistant to the Administrator for Personal Flying Development, and John H. Geisse, now serving as consultant with the CAA in completing the landing gear project which he originated as Mr. Child's predecessor. Administrator T. P. Wright accepted the plane which he hailed as an important forward step in the maneuverability of aircraft.

Getting CAA Service Tests—Before delivery, the plane was flown at Hagerstown, Md., by pilots of the CAA and the company, and will now be put through extended service tests at Washington. These service tests will include landings in higher cross-winds than have hitherto been encountered, on both concrete runways and grass fields. Results of these tests, and detailed descriptions of the castering gear will be supplied to the aircraft industry by the CAA.

In test flights made since delivery, three different pilots have flown the Fairchild plane in cross-winds of from 20 to 50 miles per hour.

Results of the first demonstration of the Goodyear development, given for CAA officials at the Chicago Municipal Airport, March 19, have also proved successful. Goodyear demonstrated that the castered-wheel gear will allow the aircraft to swing 25 degrees to either side of the runway center while the wheels maintain a straight line roll.

Give Good Performance—Mr. Geisse, who has flown both planes, reports that the cross-wind landing gear performs perfectly under all conditions and points out that little training is necessary for making landings with the new type of wheel. The same technique is used in making cross-wind landings as that used for making into-the-wind landings with conventional undercarriages.

He also reports that, almost without exception, the pilots who have flown either of the airplanes have been favorably impressed with their characteristics.

The Fairchild gear is readily adaptable to existing planes of the PT-19 type, and a similar design could be worked out for other planes like the Fairchild, Mr. Geisse said. Most of the small planes in the Piper, Taylorcraft, and Aeronca class could be converted to use the Goodyear installation.

One-Strip Fields—The CAA is sponsoring the projects in an effort to prove that planes can be built to land and take off in a side wind without danger of ground looping. Such a plane would make the use of one-strip landing fields practical. It would play a particularly important part in the present space problem of getting airports close-in to cities for the convenient use of the personal pilot.

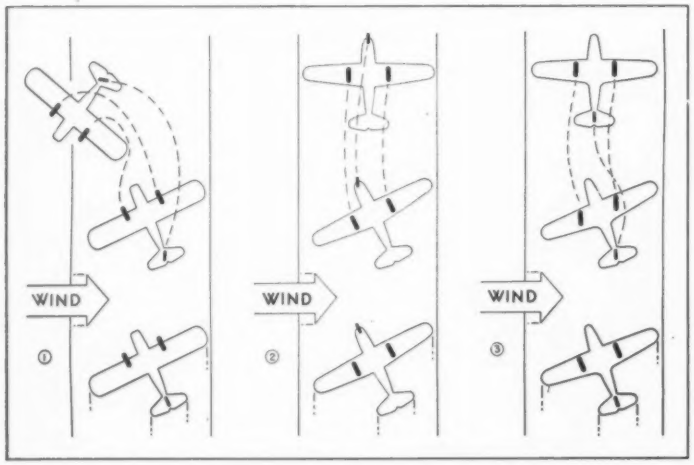
To solve the cross-wind problem the aircraft companies were given the job of developing swivel gear which will allow the aircraft to head into the wind on either side of the runway center while the wheels maintain a straight landing or take-off roll.

In the resulting devices, both the Goodyear and Fairchild gear have a cam to resist the castering and center the wheel, and both have shimmy dampeners. The main difference is in the position of the kingpin.

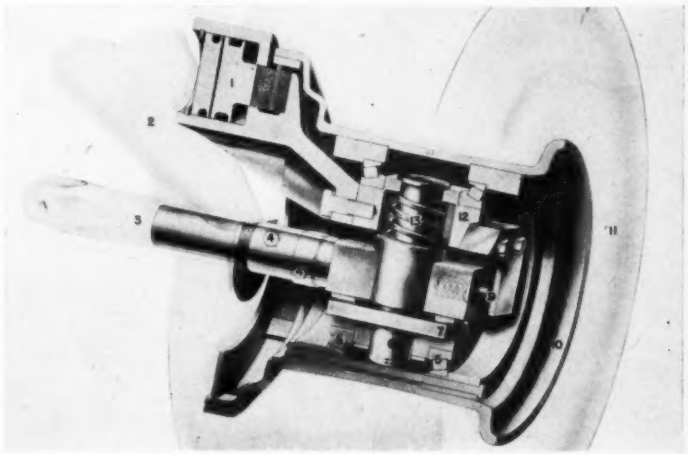
The kingpin is in the wheel in the Goodyear gear so that it can be used on airplanes in which landing gear are attached to the fuselage. In the Fairchild gear the kingpin is above and ahead of the wheel. It is applicable to airplanes in which shock struts extend directly up from the wheel to the wing.

(See Castered Gear, page 41)

Cross-wind gear on Fairchild PT-19 training plane, showing wheel in turned position, and the cam which holds wheel in straightforward position during flight. To left of cam is cylinder for control of shimmy.



The diagrams show the effect of cross-wind landings on planes with orthodox, tricycle and castered-wheel landing gears. (1) The orthodox plane with fixed front wheels and castering tail wheel makes an approach, crabbed into the wind. Striking the ground at this crabbed angle, it is swung around into the wind in a ground loop. (2) The tricycle landing gear, with castering front wheel, lands in a side wind and is swung quickly to a straight forward path but with considerable strain on the landing gear. (3) Castered-wheel landing gear allows plane to land crabbed into a side wind with no strain to landing gear. Wheels follow straight forward path and plane gradually assumes normal position while taxiing.



Working parts of the Goodyear Aircraft Corporation's cross-wind landing gear are shown as follows: (1) Goodyear single disc brake; (2) Vee strut; (3) Axle; (4) Attaching bolts will fit any standard axle; (5) Roller bearings; (6) Kingpin; (7) Compensating cam; (8) Compensating cam follower; (9) Shimmy dampener brake; (10) Wheel; (11) Tire; (12) Castering hub; (13) Return spring. Actually, the device is a castering wheel instead of a castering gear. It may be applied to any standard airplane landing gear. Parts of landing gear and axle are those normally found on cub-type plane. Only modification required was cutting off a few inches of the standard axle.

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